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ticular, topics are perceived because they are in 'marked' syntactic positions—those with special properties related to the processing of surface syntactic indicators of underlying grammatical relations. These must be recovered in any case, in order to arrive at the correct interpretation of a sentence. The speaker MAY also use this information, during or after processing of the sentence, to relate the sentence to previous discourse.

In order to demonstrate how topic, sentence processing, and rules of syntax can be related in this way, I showed in §§1-2 that variations of surface syntactic structure affect immediate processing, rather than recall, and that the variation of surface syntax is related to perception of topic. The various views of topic were contrasted; and it was noted that, if the discussion is restricted to sentence topic, rather than discourse topic, the definition of topic has to do with a salient NP which is linked with an explicit or implied antecedent in discourse context. The main body of the paper was concerned with defining how topics are distinguished grammatically from other sentence constituents. I proposed that marked syntactic structures, and particular marked positions within them, define an NP as perceptually salient, so that it can be chosen as a topic. A criterion for testing markedness was proposed, in the form of a scale of NP types—ranging from those which make 'good' topics, in the way that they point to a referent, to those whose referential properties make them very poor topics. One confirmation of the role of syntactic markedness was provided by combining a poor candidate for a topic with a particular syntactic context. In some cases, the sentence was odd, or at least non-preferred when other choices of syntactic structure were present. In others, there was no conflict of NP and context, and no preference of form. Several marked and topic devices could be combined in a sentence, so long as they defined the same NP as topic. But there was an effect of contradiction if two marked constructions in the same sentence defined separate topics. I argued that the contradiction was not a matter of logic, but rather of conflicting rhetorical purpose. I proposed that the exploitation of syntactic structure for indicating topics was basically pragmatic, rather than a primary function of grammar.

The suggestion for defining topics in English is actually a general one which could be applied to other languages. The referential properties of NPs have counterpart in other languages, while syntactic markedness is dependent on language-specific facts such as the range of choices allowed by the grammar and lexicon. No special strategies are needed to perceive topics, since the perception of topic derives from the way the rules of grammar are used to interpret sentences. How knowledge of the syntax is represented for a particular language is something which is approached in different ways in current theories of syntax. I have noted that derivational theories seem to come closer than non-derivational theories to making the distinctions described here.

My proposal for relating the perception of topics to syntax and the referential properties of NPs has some implications for models of sentence processing, and allows some speculation about why human language has the properties of allowing various surface expressions of the same grammatical relations. Parsing routines used for processing sentences, in an attempt to model human cognitive

capacity for understanding language, could be augmented to arrive at a probable topic for each sentence processed. The types on the NP scale could be assigned choices of interpretation with different weightings for topic-hood, linked to interpretation choices (such as specific vs. non-specific indefinite reference). Assuming that the form of the sentence parsing rules allowed identification of subjects in surface structure, different surface constructions could also be assigned weighting as topic-defining, depending on how opaque they are in indicating grammatical roles. The probability of given NP's as topics could be calculated at various points in the processing of a sentence.

Just as speculative, if not more so, is the question of why there are alternative expressions of grammatical relations. Clearly one of the uses to which this variety has been adapted is the definition of topic—which seems to increase efficiency when a sentence is processed in a context, as part of a discourse. But since this function is so variable in different contexts, and hence unlike a rule of grammar, it does not seem to be something which a language is required to have. It seems to be an adaptation of what is simply present in human language, possibly for some other purpose. One such purpose which comes to mind is to put the encoding of a particular message into more compact form than it might have otherwise. Relation-changing 'rules' seem to have the ultimate effect of making an NP constituent, directly or indirectly, into a surface structure subject. Subjects are more accessible to grammatical processes, such as relativization (Keenan & Comrie 1977), and are allowed to occur as empty categories whose content is supplied by other constituents. Thus propositions sharing an NP constituent can be combined in a more compact and closely related form than if the propositions had to be expressed separately.

What I have proposed here is not a new rule of grammar, or a new kind of processing strategy. Rather, I have used evidence available from a wide range of constructions, in English and other languages, to suggest a way of integrating sentence properties with the perception of topic in the most parsimonious yet psychologically plausible way warranted by the evidence. It has been proposed in general terms, both to explain the relation between surface syntax and the definition of topic in English, and to allow application to other languages. Markedness is not something which is always directly accessible to intuition; thus applications to new cases must be made by using a variety of criteria, such as the referential properties of NP's, lexical information about subcategorization, and an understanding of the range of syntactic combinations permitted by the rules of the grammar of a particular language. It is hoped that this proposal will be specific enough to allow more investigation of the properties of topics and their relation to syntax in various languages. Understanding this relation allows patterns of syntax and of pragmatics to be separated descriptively.

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such as 'has nominative case' or 'precedes the verb', but these may not be sufficient in themselves to define subjects.) Constructions which are represented as relation-changing rules in derivational theories may be regarded in a categorical grammar as rules which derive new categories, and reduce the number of arguments associated with a verb. Passive sentences contain a special category of VP, which contains an ordinarily transitive verb, but has the properties of being intransitive in passive sentences. As Susan Schmerling has suggested (p.c.), the more complex categories are those which are defined with reference to other categories: passive VP's are defined with reference to transitive VP's, which in turn are defined with reference to intransitive VP's. This ordering is reflected in first-language acquisition, with sentences of the form NP-V-NP acquired after those containing just a NP and V, and passive sentences after active ones.

Since the syntactic and semantic categories correspond, the semantic translations of complex combinations will be built up from constituents reflecting the surface syntactic organization of the sentence. The semantic translations into intensional logic of passive sentences will therefore be more complex than the translation of active sentences; but this difference is spurious. The equivalence of active and passive sentences is really defined as an equivalence of states of affairs—what is true in a particular world at a particular time. The translations into intensional logic have no special status as a level of representation. Hence it is possible to relate equivalent or nearly equivalent sentences, such as those which are part of the 'Richard' construction, without rules or movement in a syntactic derivation (cf. Partee 1976). Other constructions, such as those defined by the Raising rules and Tough Movement, can be represented as lexically governed, in that the grammar and lexicon specify a class of syntactic configurations in which a verb (or other predicative element) may appear. Markedness arises out of the fact, represented in a grammar of this kind, that a given predicate is subcategorized for a range of syntactic choices, e.g. of complement number and type. But there is no obvious means for separating the more marked from the less marked structures.

Much the same observation applies to the representation in Generalized Phrase Structure Grammar (Gazdar 1981, 1982) of grammatical relations and the ways in which they are realized in different surface structure constructions. Semantic interpretations are directly associated with surface constituents—using translations into intensional logic of simple and complex structures, as in Montague Grammar. Since there is no syntactic level of description different from the set of rules defining well-formed syntactic tree configurations, there is no explicit association of particular grammatical roles with particular surface properties, either the marked or unmarked cases. There are, however, general statements of syntactic regularities in a particular language; and the ones of most relevance here are those which associate phrase structure trees of various sorts with verb classes—e.g. finite or non-finite; sentence complements, with or without various NP adjuncts. The equivalent of transformations of the kind discussed in this paper is the specification of two or more syntactic contexts in which a given verb may occur if it belongs to the class of verb associated

with each configuration... Government of a transformation such as Raising to Object is expressed as multiple verb-class membership; thus *believe* belongs to the class associated with rule 12 (Gazdar 1982:149–50), admitting an S complement to the right, and also to the class associated with phrase structure rule 19, having NP and VP complements. Inspection of the size of the class of verbs associated with a given phrase structure rule will give some indication of the degree of markedness of the phrase structure configuration relative to all other classes, but presumably it will not specify which of the structures in which *believe* occurs is the more marked.

Grammatical relations and their surface expression are the levels of syntactic representation in Lexical Functional Grammar (Bresnan 1982). Lexical entries for verbs specify the verb complements and their grammatical functions—such as passive form, and the various morphological forms the verb may have, including for each verb the associated syntactic complements with their functions. Thus the equivalents of movement and relation-changing rules are the items in the lexical entries for verbs like *believe* (cf. Bresnan, pp. 64 ff.) Possibly the additional verb morphology for passives may indicate that the passive form and associated syntactic configurations are not basic or canonical, but it is not obvious that this characteristic can be naturally extended to other members of the class of constructions in 56. While LFG contains nothing in principle which prevents one from representing generalizations about syntactic markedness, no general feature of the syntactic description or the form of the lexical entries lends itself naturally to this function. The association of syntactic structures with specific lexical items allows the statement of lexical irregularity; but it provides no special insight into how generalizations about surface structure might be made, beyond the initial stages of language acquisition.

The foregoing observations are not intended as claims that nonderivational approaches to syntactic representation are deficient in some way as theories of grammar, or that they are less plausible models of the speaker's knowledge. Rather, my purpose has been to compare the relative advantages of one style of representation over others in current generative theories. It appears that two derivational theories come *CLOSE*, in different ways, to matching the markedness rankings and distinctions discussed in earlier section. But they do not make exactly the same distinctions as those which emerged from my application of the NP hierarchy criterion or the criterion of obligatory antecedent. It may be that additional empirical data and refinement of the criteria, or evolution of the theories, will strengthen the match. In any case, nothing prevents the stipulation of markedness in non-derivational theories—in the form of weightings attached to particular syntactic configurations, or non-grammatical strategies of various kinds.

9. CONCLUSION. In the preceding sections, I have proposed a particular view of topic, its definition, its relation to sentence syntax, and its function in discourse. In this proposal, the perception of topic has a function that allows efficient matching of a sentence to context, and this is a direct consequence of the processing of the lexical and syntactic contents of a sentence. In par-

its grammatical role and to become a *chômeur*. The disparity of roles in different strata may, however, be slightly too broad, as it will encompass a special class of intransitive clauses having an underlying object (or non-accusative term) which is promoted to subject. It is not clear that these surface subjects are more marked than ordinary intransitive subjects; empirical evidence may decide the issue.

Grammatical roles are represented in quite a different way in another derivational theory: the government and binding theory of Chomsky 1981. This theory recognizes two levels of syntactic representation, which share certain properties, and which are related by various means including a movement rule. Semantically relevant grammatical functions are assigned to NP constituents at D-structure, by verbs, combinations of verbs, and the elements which are subcategorized by them. Case is assigned or checked in S-structure. In active clauses, the verb assigns the semantically relevant grammatical role, or *THETA* role, to its subcategorized objects; the Verb Phrase assigns a *theta* role to some subject positions. The object receives case from the verb which subcategorizes it, the same element which assigns its *theta* role. But the subject receives surface case from the tense inflection or from another element which counts as a governor (not the verb of which it is the subject).

A marked structure and its marked constituent can be characterized as part of this pattern. The element which assigns case is not the one which assigns a *theta* role. Passive sentences are derived when the movement rule moves the object NP to an empty subject position having no *theta* role (as the combination of verb and passive morphology assigns none). Prepositional passives are derived in the same way, after an optional restructuring rule which forms a complex verb—with the prepositional object as a direct object. Raising to Subject constructions are derived by movement from one subject position to an empty subject position in a higher clause, with the verb of the higher clause also having the exceptional property of governing deletion of one of the S elements, S', which dominates the lower clause. Raising to Object is also represented as an instance of S' deletion, governed by verbs which again assign accusative case to the adjacent lower-clause subject. In both cases, the lower-clause subject is assigned a *theta* role by the lower-clause verb, and is assigned surface case by an element in the higher clause. Tough Movement, which involves movement over a variable, is treated in a more complex way than the Raising cases. The constructions mentioned so far have involved movement to or from positions held by arguments—subjects and objects—within a clause, over at most one S boundary. Since Tough Movement involves movement over one or more clause boundaries, it is treated as the movement of a null object to COMP position adjoining its clause of origin. The null element is co-indexed with lexical NP, which is base-generated as a subject with an independent *theta* role in the clause of the form [NP_i is ADV (*for* NP) (e_i (. . . V e_i))] (Chomsky 1981:309 ff.) It is a marked construction, in that it involves identity of subjects and objects, and disparities between S-structure and D-structure—but not in the same way as the others. It merges with other constructions involving movement of NPs to non-argument positions, notably Topicalization, in which an element in ad-

joined COMP position corresponds to an empty element within a clause structure. The latter are much more marked, however. Nothing in the description predicts the difference.

Dative constructions are base-generated in different configurations, so that no movement is involved: the synonymy relation is expressed only in terms of semantic interpretation. Adverb Preposing is a stylistic movement rule in Phonic Form, involving no case or *theta* roles, and leaving no co-indexed empty categories. *There* Insertion involves no movement from subject position, as the postposed NP is generated in that position in D-structure. It receives case and a *theta* role from the inflection and verb respectively—but less directly than in subject position, which perhaps accounts for its non-salient properties.

It is interesting that such basically different approaches to syntactic description as Perlmutter's and Chomsky's make similar distinctions, giving subjects special properties and distinguishing constructions which have undergone changes in derivation (affecting either grammatical relations as primes, or more complex descriptions of surface and underlying syntactic expressions of grammatical roles) from others in which grammatical roles and grammatically relevant configurations are basically unaltered. Both approaches treat surface structures in a general way: thus Relational Grammar has rules for expressing unordered, final strata in terms of surface word order, constituency, and case-marking. Surface structures in GB theory are subject to general conditions on possible well-formed combinations. This theory is more restrictive in its definition of possible movement-derived constructions; Dative Shift and 'Richard' are not treated as movement rules—the former because of constraints on movement to positions already having *theta* roles, the latter because it involves pronouns rather than gaps, unlike Raising. Different degrees of markedness of specific constructions may be expressed in both approaches in terms of rule government. Constructions not dependent on the presence of a member of a small or restricted class of verbs are less marked than those which are governed by only a few verbs or subject to other limitations, such as those constraining Topicalization.

Non-derivational theories relate surface structures directly to some representation of meaning relations, with no intermediate, syntactically defined level of representation. While in principle nothing prohibits descriptions of this general class from representing relations of which salience and markedness might be consequences, the ways in which this might be done are considerably less transparent than in the cases just mentioned. Thus there is no direct syntactic representation of the fact that the subject of a passive sentence corresponds to a member of a transitive VP in another sentence, or that the passive sentence represents grammatical relations in a more complex or less direct way than the corresponding active sentences.

The status of grammatical relations in Montague Grammar has been discussed in interesting and illuminating ways by Dowty 1978, 1982. Definitions of surface grammatical relations correspond to category definitions: subjects are members of the syntactic category which combines with an intransitive VP to form a sentence. (This definition may seem more complex than simple criteria

be found in the Standard Theory of Chomsky 1965, in which phrase structure trees are mapped into other phrase structure trees by transformations which specify certain syntactic operations. To select marked constructions, it would be necessary only to see where a constituent had been moved or had changed its clause membership. But this characterization turns out to be too broad. It includes not only the marked constructions of 56, but also those which turn out to have somewhat different properties, e.g. Dative Shift, Adverb Preposing, and *There* Insertion. The special prominence of subjects is not a direct consequence of anything about subjects as they are represented in the phrase structures or mentioned in transformations. (Though many transformations operate on basic or derived subjects, there is no theoretical explanation for why this might be so.)

A theory which treats grammatical relations as primes might have more success in this regard. Relational Grammar (as defined, e.g., by Perlmutter & Postal 1983a,b) treats the constructions of 56 uniformly as advancements to and/or from subject role. Subjecthood is distinguished from other grammatical roles by being the highest in a hierarchy of grammatical relations; although other constituents may change their roles by assuming a higher role, subjects in general cannot. Active structures in English involve transitive clauses in which no relation-changing rule applies, while Passive involves the advancement of a direct object to subject. The displaced subject ceases to have any grammatical role, and is put 'en chômage.' Prepositional passive sentences are derived in the same way, with the prior application of a rule which allows oblique terms, expressing location and other roles, to assume the role of direct object. The Raising rules are ascensions of subjects of lower clauses to become members of a higher clause, assuming the same grammatical role which their host clause had. Tough Movement is an ascension of a lower-clause direct object, which assumes the role of subject in a higher clause because it originates in a subject clause. The rule is distinguished by the fact that the ascension occurs over a variable, not necessarily in adjacent clauses. The 'Richard' rule could in principle be treated like Raising to Subject, with ascension of a subject to the subject role of its host clause. The only difference is that, in the surface form, derived from the final stratum of representation of grammatical relations, the lower-clause position has a pronoun instead of a gap. Topicalization and Dislocation are represented as *OVERLAYS*—constituents which have normal clause membership and grammatical roles within the clause, but also have functions as topics or contrasted elements.

The representation in terms of relational networks allows a natural characterization of the constructions of 56. They are constructions in which constituents have more than one role, within a clause and an overlay, or in different clause strata (or both). In the latter case, subjecthood is crucial; except in Raising to Object, the salient constituent is a term advanced to subjecthood in a clause. This advancement involves change of grammatical role and/or clause membership. Adverb Preposing and Dative Shift are outside this class, since they fail to meet this criterion; and *There* Insertion is different, because the insertion of the dummy *there* as subject causes the displaced subject to lose

uses the same strategies along with rules of grammar. Further, it does not explain some properties of markedness noted in §4-5, e.g. the tendency to associate topic function with subjects, even in unmarked constructions, and the absence of markedness in preposed adverbials, postposed NP's, and agent phrases. It also does not explain the association of salience with a particular NP within a marked structure (unless the marked NP is the one at which the strategies begin to fail, going from left to right, or the point at which reprocessing must begin). But on this account, Raising to Subject should be more marked than Raising to Object, so that the first NP in the former case is wrongly assigned the interpretation of subject of *seem*, etc.

Hence the reliance on strategies in addition to knowledge of grammar is not very useful. Since the use of strategies in children precedes full learning and productive use of the rules of grammar, we would do better to see the overgeneralized strategies as being revised in stages of learning, and then incorporated as the real rules of grammar.

The appropriate rules should allow the speaker of a language to distinguish between marked and unmarked constructions, and to pick out the marked NP positions within them. A subset of these marked NP positions are subjects, which in themselves have some marked properties—since even in unmarked constructions, subjects are salient. The syntactic rules of the language specify what surface configurations and combinations are permitted; and more generally, how grammatical relations are encoded in surface structures. Lexical information about verbs specifies the type of possible complements and the grammatical rules assigned to them.

It is assumed here that the same grammatical knowledge is used for what might be called the primary functions of grammar, specifying well-formed and interpretable combinations, and for the secondary and derivative properties which have been discussed above. Hence it is necessary to look at the representation of primary grammatical relations, to see if the secondary properties are direct consequences of representation, and whether they come close to making the distinctions which have emerged from the application of tests for markedness to various constructions.

Derivational descriptions as a class have a property which may explain the ability of the speaker to distinguish a marked from an unmarked expression of the same grammatical relation. A derivational theory includes at least one level of syntactic description other than surface structure. Unmarked constructions are those whose surface representations are not very different from their underlying representations, while marked ones are those for which the surface and other syntactic representations differ in some syntactic properties—a difference sanctioned by a syntactic rule, such as one of movement. The difference between marked and unmarked structure is perceptible, since the underlying form in the unmarked case may also occur more or less unaltered in surface structure. In an active structure (the unmarked case), the direct object occurs in postverbal position with accusative marking. In the marked case, it occurs in subject position, but is related by the syntactic rules to object role and postverbal position in the underlying structure. The simplest approach might

Language-specific conditions may widen the class of possible topics, or make it narrower. Some examples of the former occur in Chinese and Norwegian. Topics in Chinese are marked by position and pause particles, not by morphology or special topic particles (cf. Li & Thompson, Tsao). Elements in initial position are perceived as topics; these may be subjects in their normal position, or other elements preposed to the left of the subject (cf. Li & Thompson). Since topics have no distinctive or unique property other than position, the difference between 'plain' and topicalized structures is less clear, and Topicalization should be less marked as a construction than in English. According to Huang 1982, two or three NP's may occur in preposed position and be perceived as topics.²⁶

There is a special restriction on preverbal or subject position in main 'asserted' clauses in some of the Germanic languages, including Norwegian. (This is not true in English, unless a negative constituent or certain other types are preposed. Normally, English permits a sequence of preposed adverbial and subject before the verb.) In languages such as Norwegian, the subject is postposed if any other element is preposed, including an adverbial. This is true both in main clauses and in syntactically subordinate clauses, in the complements of verbs like 'think' (Faarlund 1981);²⁷ adverbials in preposed position (e.g. *da* 'then', *der* 'there', *elles* 'otherwise') may have a connective function, just as topics may. The condition imposed on Norwegian, whatever it may be, its grammatical role and morphological marking are not changed, though the subject loses its topic possibilities if it is not in preverbal position. While other properties of relation-changing rules may be analogous to English, and may create the same kinds of marked surface structures, the addition of the X-V condition gives additional salience to preverbal position. Preverbal and postverbal elements do not contrast as sharply as in German.

Constructions in other languages which can be compared to those in English may have different degrees of markedness, following from language-specific conditions. If the class of verbs which governs the counterpart of Raising to Subject is smaller than that governing Raising to Object, then we would expect the reverse of the situation found in English for markedness.²⁸

8. THE ESSENTIAL PROPERTIES OF SYNTACTIC MARKEDNESS AND THEIR REPRESENTATION. Up to now, the discussion has been concerned with the relation between topics and surface syntactic structures, and has been as neutral as

²⁶ It is not clear that all these multiple topics are combinations of distinct topics; many of them consist of constituents semantically linked by a whole-part or class-member relation.

²⁷ These are comparable to the predicates discussed by Hooper & Thompson, whose complements allow Main Clause Phenomena. In Chinese, topic constituents may be extracted from main clauses and from the complements of verbs such as 'believe', 'remember' (cf. Tsao).

²⁸ Raising to Object in Hindi is governed by fewer predicates than in English, but it has similar properties: if an NP which is part of a fixed expression is a lower-clause subject marked as object by Raising, it ceases to have its idiomatic reading and has only a literal reading (R. Pandharipande, p.c.) Raising to Subject in Pagan Fijian is more marked than Raising to Object because of a difference in number of verb governors and in the verb complements which are affected by the rule (G. Carden, p.c.)

possible with respect to the representation of syntax. But the discussion now turns to differences in theoretical approaches to syntax, in the ways that they represent the constructions of §§4-5. This discussion depends on a certain assumption: that the grammar itself, along with the representation of rules of syntax, lexical classes etc., tells the speaker of a language what is marked. This assumption excludes the representation of topic as a grammatical category defined by phrase structure rules, and also excludes any special routine added for the processing of sentences. It will be assumed, in contrast, that speakers do not have to perform the operation of finding a topic in addition to identifying the syntactic constituents of a clause and their grammatical functions. It has been proposed above that the properties of NP's and syntactic contexts cause NP's to be perceived as salient and as topics.

The speaker should, then, be able to perceive markedness solely on the basis of what is already known about language. Even quite young children seem aware of topic differences in sentences (see references in §1), and it is reasonable to assume that the only necessary experience is in using language in a discourse context—relating sentences to referents—and in using the rules of the grammar.

Before proceeding to the discussion of the representation of syntactically marked properties, I want to consider one other alternative. While special strategies for finding topics have been ruled out, they might be plausible, particularly the types which have been observed in children at early stages of language acquisition (Bever 1970). These are not strategies directly related to topics, but they are related to surface syntactic processes and their interpretation.

Processing of linguistic structures, especially syntactic structures, might be more efficient if a strategy did exist which assigned semantic relations directly on the basis of surface grammatical information. In the discussion of syntactic markedness in §4, it was noted that the marked structures are those which encode underlying, semantically relevant grammatical relations in a way which does not correspond very directly to surface form—e.g., in a passive sentence, an object is represented as a surface subject. If such strategies were at work, they would be successful and efficient in the unmarked constructions, and they would fail in the marked cases. In the latter cases, the sentence would have to be fully processed, referring to particular rules of grammar, properties of verbs, etc.

Bever proposes strategies of this sort to account for the stage of first-language acquisition in which children overgeneralize—e.g. interpreting all preverbal NP's as subject/agents, or all collocations of adjacent NP-V-NP as constituents of a clause, with the underlying roles appropriate to a surface subject and object. Such strategies, applied to all the unmarked cases in §4, will give correct interpretations. But they will fail for all the marked cases, giving incorrect interpretations for the instances of the relation-changing rules, and no interpretation for preposed adverbials and extracentential NP's. So one might view these strategies as persisting into later stages of language acquisition, becoming adjuncts to the full grammar which simply increase efficiency. This view has some plausibility, but it requires the assumption that everyone

and its exploitation for defining topics. First, the set of semantic/pragmatic properties reflected in the NP scale 27-29 is established, starting with the basis of preference for surface form with Raising to Object. Second, the scale is extended to test other syntactic structures, and NP positions within them, to establish if they are more marked than Raising to Object, or less. The result, the degree of syntactic markedness, is summarized in the syntactic scale in 56, the relative rankings can be rationalized after the fact by examining the properties of the constructions. The more marked constructions are governed by more limited classes of verbs; they are subject to more syntactic restrictions; and they specify less conspicuous surface structures—the underlying grammatical relations are not so easily or directly 'read' from surface structure information. The existence of perceived differences in interpretation or in degrees of markedness depends critically on the existence of contrast, a range of options more or less comparable with one another, which are specified by the grammar of a particular language. The markedness of a particular structure is not directly accessible to intuition or analysis in isolation. Rather it must be established relative to other constructions in the language.

These two factors—referential properties of NP's, and the markedness of syntactic structures—also enter into the definitions of the markedness of syntactic structures in other languages, and of the topic-defining properties of these constructions. The classification of NP types in another language according to the NP scale may involve fewer categories than in English, or more. That is, there may be more use of determiners than in English, or of classifiers used in combination with determiners and nouns.²³ But the relative ranking should be the same, since they are based on pragmatic and semantic features such as definiteness, specificity, concreteness, and the presumption of an existing referent. These categories may differ across languages in how they are expressed and in conditions on appropriateness of use, but not in nature. That is, it is not to be expected that proper names and definite NP's in some language would be less compatible with topic function than idiom chunks or non-specific generic indefinites, reversing the ranking of 27-29.

In contrast, the syntactic scale is not a given which holds across languages. The rankings in 56 are dependent on specific facts of the syntax and lexicon of English. Assuming that it is possible to identify constructions such as Passive across languages in terms of grammatical relations (as in Keenan 1975, Perlmutter & Postal 1983a), it is to be expected that the markedness of the construction will not necessarily be that of the corresponding construction in another language—or, as a consequence, that their topic-marking functions will be identical. Markedness will depend on some language-specific conditions, such as the size of the class of the verbs governing the construction, the contrasts allowed in the surface encoding of grammatical relations, and syntactic rules and conditions which may limit the properties of topic NP's or contrasts of structure.

²³ Different sets of determiners exist in Cambodian for different sentence contexts—affirmative, non-affirmative, and emphatic (Jacobs 1965). Classifiers for person, thing etc. may have some functions of indefinites in Thai and other languages (Davison 1980a, and references cited there).

ical relations. The structure in 98b expresses the same grammatical relations, but in the surface order which would result from applying Dative Shift and Passive to the structure underlying 98a. Hence the NP position of a *local shelter* in 98b should be highly marked, if the specification about the surface expression of grammatical relations associated with lexical items like *receive* were directly equivalent to surface structure expression of grammatical relations specified by various surface options of syntax. But in fact, it does not seem that anything results from a difference in the position of a *local shelter* in the two sentences, with respect to the restrictions that syntactic position places on the available readings.²⁴

On the evidence of this section, syntactic markedness is not directly specified as a property of syntactic position or syntactic rules; thus it is pragmatic in nature. It is an effect associated with the perception of syntactic structure. The over-all degree of markedness associated with an NP is determined by the most marked position it occupies, whether this is the one it has in surface structure, or another with which the NP is associated by a rule of grammar—including the one which it occupied at the point of lexical insertion. This degree of markedness is not changed by subsequent applications of relation-changing rules in the grammar.²⁵

It appears that syntactic rules which change grammatical relations from the canonical patterns of a language do create syntactic complexity for processing, while lexically based variations do not. But we need experimental evidence about syntactic processing which contrasts lexically vs. syntactically encoded surface grammatical relations before we can give a decisive answer to the question of whether, as I have proposed, syntactic complexity is a consequence only of syntactic surface encoding.

7. APPLICATIONS OF SYNTACTIC MARKEDNESS IN OTHER LANGUAGES. Two distinct components enter into the definition of syntactic markedness in English

²⁴ Lexically related pairs of verbs such as (x) *walk* and (y) *walk* (x) are like *give* and *receive*, even though the fact that the syntactically intransitive subject corresponds to the transitive object might suggest that the NP in subject or object position should be marked. But there is no difference in acceptability in the following examples:

- (a) The heaviest door in the building opens (even though one might not expect this to be the case on account of its weight).
- (b) An electronic mechanism opens the heaviest door in the building, because otherwise it would be impossible to open it.
- (c) Any dog walks faster than its owner wants to go.
- (d) John walks any dog faster than it wants to go.

²⁵ The view that markedness is pragmatic receives some additional support from the fact that other pragmatic factors affect it. A syntactically subordinate clause may have properties usually associated with main clauses if, among other things, the higher predicate is one of the class containing verbs like *suppose*, *think*, or *believe*; thus the higher clause is interpreted as 'transparent' pragmatically, or as an epistemic modifier on the subordinate clause (cf. Hooper & Thompson). Syntactic markedness is a fixed property of syntactic structures, but its value in processing sentences will be perceived only for clauses seen as 'asserted', and subordinate clauses are 'asserted' or not depending on a variety of pragmatic factors. Only in 'asserted' subordinate clauses are topic-defining properties perceived. (See also fn. 22.)

- (92) a. The slightest noise seems to register on this recorder.

b. The slightest noise is muffled by the insulation.

c. ??We believe the slightest noise to be disturbing to them.

It might be the case that the position in which the NP occurs in surface structure would be decisive. If the NP 'escapes' from an original marked position to a less marked one, then the whole sentence should be acceptable. But the combinations below are no better than the deviant (91-92):

- (93) a. ??Any doctor seems to be believed to know the answer.

b. ??The slightest noise seems to be believed to be disturbing to them.

The *any*-generic NP is of a type low on the NP scale, and so should be odd in the marked position defined by Raising to Object. Raising to Subject and Passive tolerate such NP's much better, in isolation. Yet the fact that the NP ends up as the subject of *seem*, via Passive and Raising to Subject, makes no difference.

Conversely, it might be the case that, if the most deeply embedded clause contains an unmarked NP position, the complex sentences of 94 should not be deviant—even though the generic or superlative occurs in surface structure in a marked NP position:

- (94) a. ??Any doctor is (believed/supposed) to seem to know the answer.

b. ??We (suppose/believe) any doctor to seem to know the answer.

These sentences are no better than the others. It seems to make no difference whether the marked position is the one in which the NP occurs overtly in surface structure, or whether it is simply a position which lacks an overt NP in surface structure, but is interpreted semantically as including the NP. If a rule of grammar sanctions the occurrence of an NP in the marked position associated with that syntactic rule and grammatical configuration, then the degree of markedness appropriate to that marked position is invoked and associated with the sentence as a whole. These facts are in accordance with the treatment of syntactic markedness as a pragmatic phenomenon—the consequence of syntactic properties specified by the grammar, but not in itself something specified by rules of grammar.

The notion of syntactic markedness which has been proposed here is one which is derived from properties of surface structures—more specifically, the range of surface structures permitted by the grammar, including what has traditionally been called optional relation-changing rules, however they may be represented in a particular grammatical framework. Properties of lexical issues may also be described in terms of grammatical relations. Some semantically related lexical verbs, e.g. *give* and *receive*, differ just in the way that grammatical functions are assigned to the verb's arguments. It might then be the case that lexical items, in addition to surface structures, define marked NP positions:

- (95) a. Three business firms gave useful equipment to local charities.

b. Local charities received useful equipment from three business firms.

The recipient is expressed as a prepositional phrase in 95a, and as the surface

subject of an active sentence in 95b. If the structure of 95a represents the 'unmarked' or canonical expression of grammatical relations in English, then the structure of 95b represents the marked case—with the subject position being marked or salient, which would be expected to place restrictions on the kind of NP which may occupy that position. Most NP types which are low on the NP scale are incompatible with the semantic role of recipient (e.g. abstract NP's of extent of place or time). But *any*-generic NP's and superlatives may occur as the lexical contents of an NP having the grammatical role of recipient:

- (96) a. Local businesses will give a \$500 donation to any non-profit organization.

b. Any non-profit organization will receive a \$500 donation from local businesses.

- (97) a. Local philanthropists will give \$1,000 to the most deserving student.

b. The most worthy student will receive \$1,000 from local philanthropists.

If the intended reading of the superlative NP, *the most worthy student*, is the 'end of scale' reading, no oddity of the kind which turned up in syntactically marked positions in §5 is present. The other readings of the NP as a definite description, where the superlative form is taken as emphatic, are the referential and attributive uses of definites. In syntactically marked positions, the referential use is favored over the attributive reading. But again, there seems to be no difference of this kind in 97.

Indefinite NP's are also sensitive to marked NP positions, and the non-specific indefinite reading is less available in marked NP positions.²² In this case, there should be a difference in the readings available for the NP expressing the recipient in the following:

- (98) a. A retired businessman gave useful equipment to a local shelter.

b. A local shelter received useful equipment from a retired businessman.

The structure in 98a represents the unmarked surface expression of grammatical

²² The contrasts of readings available for NP's are observed most clearly in main clauses. It is also true for the perception of subjects as topics. Main clauses are held to be 'asserted', or to be the main body of the new information in a statement, as opposed to what is taken as given, and various syntactic processes which prepose non-subjects and postpose subjects are more likely to occur in main clauses (cf. Hooper & Thompson, and more detailed discussion of Main Clause Phenomena in Green 1976). If clauses and NP complements (*the idea that S*, etc.) are not asserted, and do not have to refer to actual states. In such clauses, a subject NP is not perceived as a topic, so there is no special bias for the specific interpretation of indefinites:

(a) If a donation is offered by a businessman, check with me.
(b) If a businessman offers a donation, check with me.

Further, a very marked construction such as Raising to Object creates a peculiar conflict in that an indefinite NP cannot have a specific interpretation, which is more or less forced by the features of syntax:

(c) If you believe that a confidence man is operating in your neighborhood, inform the police.
(d) ??If you believe a confidence man to be operating in your neighborhood, inform the police.

Quantified NP's are not particularly felicitous in extrasentential position, unless they are also definite.

- (81) a. She read {many books / all those} books in a week.
 b. All those books, she read {____/them} in a week.
 c. ??Many books, she read {____/them} in a week.

Sentences like 81c are somewhat less acceptable than 81b, provided that the intonation on *many books* is neutral rather than contrastive, and that a 'collective' interpretation is meant for *many*. Gundel notes that non-specific, indefinite, and some generic NP's are also excluded. In general, NP types low on the NP scale are odd in dislocated or topicalized position. These constructions place the same kind of restriction, therefore, as those in the scale of syntactic markedness, but do so more strictly.

If we take the adjoined NP as a topic (with the exceptions noted above and in Prince 1982), the definitions of topic via the extra-clausal NP and via syntactic markedness within the clause match very closely. If the topics match, all is well. But a non-match results in a sentence that is pragmatically contradictory, if not absolutely ill-formed:

- (82) a. That guy, we believe {him/Ø} to be the mastermind behind those crimes.
 b. ??Those crimes, we believe that guy to be the mastermind behind {them/Ø}.
 (83) a. We believe him to be the mastermind behind those crimes, that guy.
 b. ??We believe that guy to be the mastermind behind them, those crimes.

If the occurrence of existential *there* in subject position and role allows the inference that the sentence has no topic, then the presence of an adjoined NP as topic is also ill-formed and pragmatically contradictory:

- (84) a. ??There seems to be it on the table, a telephone.
 b. ??A telephone, there seems to be Ø on the table.
 c. ??There seems to be one on the table, a telephone.
 d. ??A telephone, there seems to be one on the table.

If *there* occurs in subject position, then the displaced NP *a telephone* is a demoted subject, and no longer a possible topic. Other NP's in the sentence, such as *the table* in these examples, are not ex-subjects, and so might indeed be possible topics. These sentences are not perfectly free of oddity, but they are better than those in 84:

- (85) a. ??There seems to be a telephone on it, the table.
 b. The table, there seems to be a telephone on it.
 c. ??The table, there seems to be a telephone on Ø

Note that the combination of two topic-defining devices in (82-83)a does not result in redundancy if they pick out the same NP as referring to a topic. If topic definition were semantic in origin—if an adjoined NP, e.g., MEANT 'topic'—we might expect some redundancy (cf. Sadock 1978). But the mismatch of topic in (82-83)b involves no SEMANTIC contradiction, nor any violation of a syntactic condition on co-indexing. The effect is pragmatically

contradictory, conveying that the sentence is simultaneously about two entities; but the sentences are not ill-formed grammatically.

For the same reasons, it is possible to combine Topicalization of one NP with Raising to Object (Exceptional Case Marking, in EST) of another, provided that the latter has null reference:

- (86) a. Those problems, we believe there to be at least one solution to
 b. We believe there to be at least one solution to them, those problems.
 (87) a. These crooks, they reported tabs to have been kept on ____.
 b. Those problems, we believe nobody to have solved ____.
 (88) a. Four cities, they report it to be raining in ____.
 b. The whole region, it was said to be over 100° in ____.

While the syntactic properties of the sentences in 86-88 define an NP like *there* as salient, and a possible topic, its status as an actual topic is vacuous because of the lack of an actual referent. This is clearly true of *there* and negative NP's—perhaps less clearly so of *tabs* and *it* if one can imagine something in the world corresponding to them. Raising of empty NP's, in and of itself, creates no contradiction. In fact, the raising of *there* may serve to prevent raising of an NP which is meant to have a non-specific reading, which it would lose if it underwent Raising:

- (89) a. It seems that there's a fly in my soup.
 b. There seems to be a fly in my soup.
 c. A fly seems to be in my soup.
 (90) a. We believe that there's a riot in the offing.
 b. We believe there to be a riot in the offing.
 c. We believe a riot to be in the offing.

I assume that the choice of the syntactic structure (89-90)b over (89-90)c is free, from the point of view of syntax; that is, the syntactic or semantic well-formedness of (89-90)b is not dependent on some kind of pragmatic assumption or condition. The choice of syntax in various combinations of lexical NP's is free, but certain combinations turn out to be pragmatically contradictory. The phenomena discussed here are likely to be pragmatic.

Markedness of syntax and pragmatic properties of NP's are derivative notions—consequences of the processing of sentences, and of relation of the sentence to its context. Markedness might, however, be a solely syntactic property of certain configurations: in combination with other constructions, it might be increased or decreased. But the evidence suggests that markedness, apparent in the combination of an NP of a certain type in syntactic contexts of various types, does not vary. The deviant combinations in 91-92 remain deviant regardless of combination with more vs. less marked constructions.

The constructions in 91-92 range from less marked to more marked, by the criterion of the possibility of substitution of NP types:

- (91) a. Any doctor seems to be able to do that.
 b. ??Any doctor is paid directly by the reimbursement plan.
 c. ??We believe any doctor to know the answer to these questions.

marked syntactic position, the consequences of considering it a marked NP and topic are harmless, since it has no referent.

If *there* counts as a topic, then the sentence in which it occurs is interpreted as being ABOUT a null referent. In other words, when *there* fills an empty subject position, it also conveys that the discourse context does not contain an index for an NP constituent in the sentence. Hence it is not surprising that this construction is typically used for introducing new referring expressions into the discourse. (While some obvious exceptions to this general characterization exist, there are explanations and accounts of them which are consistent with it; cf. Miltsark 1977, Rando & Napoli 1978).

The postverbal NP, as an ex-subject, is not included in the repertory of marked NP positions; it is like the agent phrase in a passive sentence which does not count as a surface subject. If the displaced NP in *There* Insertion sentences were a marked and salient NP, its status would be no different than if it had remained in preverbal position. So the properties of NP's which make good topics or bad topics should be equally compatible with either position. But there are differences of interpretation of the displaced NP's in pairs of sentences in which their position varies, and where *there* is present or absent:

(75) a. There is a fly in my soup.

b. A fly is in my soup.

(76) a. There doesn't seem to be a waiter here.

b. A waiter doesn't seem to be here.

Indefinite NP's with a non-specific interpretation occur in postverbal position, as in (75-76)a. If the same indefinite NP occurs in preverbal subject position, its most natural interpretation is specific rather than non-specific. If one is only complaining about the soup (and not trying, e.g., to locate the third of three known flies), then 75b is a pragmatically odd thing to say. Likewise, 76b more naturally conveys that the speaker has a particular waiter in mind. The position of the NP does seem to make a difference for discourse processing, in that postverbal position with *there* does not convey that there is a previously evoked referent; but preverbal position is far more likely to suggest a prior antecedent.

If the postverbal NP had the salient properties of NP's perceived as topics, then we would expect that NP's in this position would be odd if their contents were of the types which are low on scale 27-29. In fact, many NP types which are low on that scale are quite acceptable in postverbal position:

(77) a. There were tabs kept on Lefty and his friends.

b. There was no headway made in the negotiations over the weekend.

(78) a. Where can I get a socket wrench?

b. Well, there's any hardware store.

Idiom chunks like *tabs* may occur with *there* (77a), as well as any-generic NP's (78b). Non-generic definite NP's, including superlatives and definite descriptions, generally do not occur with *there*, perhaps because the prior existence or mention of an antecedent is strongly suggested by the lexical content of the NP. Abstract NP's of time and place 'exist' simply according to the specification of their properties, so it is odd to use them with a verb of existence or

motion. For several different independent reasons, then, these NP's do not occur in *There* Insertion; but where position of the NP might be expected to affect interpretation, we do find differences of a kind indicating that NP's in postposition lack topic properties.

Three constructions have been discussed which do not exhibit the same array of marked properties as the constructions described in §4. In particular, dative NP's, preposed adverbials, and postposed subjects in sentences with the expletive *there* do not occupy syntactically marked positions which make the resident NP salient, or which restrict the type of NP which may occur there. The syntactic properties of these positions do not, in themselves, define an NP as a topic. This is the expected state of affairs: Adverb Preposing does not change grammatical relations at all, Dative Shift does not affect subjects, and the *there* construction serves to 'demote' the subject in the same way as the passive agent.²¹

6. COMBINATIONS OF MARKED CONSTRUCTIONS AND THE 'LEVEL' WHERE MARKEDNESS IS DEFINED. Some additional confirmation can be found for syntactic markedness and the perception of NP's as salient by combining different types of syntactic constructions within the same sentence. It has been proposed that the constructions which are ranged along the scale of syntactic markedness in §4 define a marked NP position, and the NP occupying that position is perceived as a topic. It is also a widely-held position that dislocated and topicalized NP's have topic properties (cf. Gundel 1977, Prince 1982). It was noted in §5 that postposed subjects in sentences with *there* exhibit 'anti-topic' properties. There should be differences in acceptability of sentences combining these constructions, depending on whether the syntactic properties so combined define the same NP's as topic, or conflict as to which NP's are in marked positions. This prediction is borne out.

Before looking at combinations involving Dislocation and Topicalization, note that NP's in extrasentential position are somewhat more restricted than sentence-internal marked NP's, with respect to the scale in 27-29. Negative NP's, or NP's in the scope of negation, are generally impossible in sentences like these:

(79) a. We saw nobody that day.

b. We didn't see anybody that day.

(80) a. *Nobody, we saw {___/them} that day.

b. *Anybody, we didn't see {___/them} that day.

c. *We didn't see them that day, anybody.

d. *We saw them that day, nobody.

²¹ The term 'demoted' immediately suggests the view of grammatical relations taken in Relational Grammar. The view of postposed subjects and passive agents in that theory matches quite closely the properties of NP's which are relevant to the distinction made here. These NP's are regarded as bearing no grammatical relation in their clauses at the time that surface structure relations are specified; they are 'en chômage' because some other NP has taken on the grammatical role they previously held (unlike the Raising to Object case; cf. Perlmutter 1983). Fuller discussion of how the relevant marked properties are expressed within the context of particular grammatical theories will be given in §8.

A similar effect can be achieved if none of the adverbials are proposed:

- (71) a. Louis-Philippe abdicated from the French throne in 1848.
- b. Charles Louis Napoleon Bonaparte became president of the Second Republic in 1848.
- c. Revolutionary movements began in many European countries in 1848.

The salience and connectedness results from the CONTENT of the adverbial. But if the content were parallel but not identical, then sequences like 70a-c would illustrate repeated surface structures in discourse. Recognition of such local discourse patterns seems to be different from the use of syntactic structure to relate constituents to over-all context; but clearly, we need to know more about how such patterns are recognized.

In ex. 70, the salience of proposed adverbials may be explained in terms of their content, not their form. In another instance, also involving sentences with parallel structure, proposed adverbials have a connective function. There are coreferent relations between the proposed adverbials in 72b and the context in 72a:

- (72) a. His irritation is due to the conflict of two feelings—the one, that whatever is true must have a reason; the other, that the reason he has already given is so obvious that it is merely contentious to demand a reason for the reason.
- b. In the second of these feelings, he may be right; in the first, he is certainly wrong. (B. Russell, *The subject matter of ethics*, quoted and discussed in Smith 1971.)

These coreferent relations would exist in any case, because they are signaled by the use of demonstratives, e.g. *these*. Preposing places the adverbial containing the demonstrative closer to its antecedent, and the parallel pattern of surface structure also makes the connection more evident. But the connection would be there, and would be salient, by virtue of the demonstrative, regardless of the position of the adverbial.

To see whether preposing has topic-marking function in and of itself, we need to consider examples without repeated elements and without definite articles or demonstratives. The context 73 contains possible antecedents for either *tornadoes* or *regions*. The structure of 74a defines *more than a dozen tornadoes* as a topic, because of its subject properties:

- (73) Severe storms are a hazard of the spring and summer in the mid-west.
- (74) a. More than a dozen tornadoes occurred last year in several regions.

b. In several regions, more than a dozen tornadoes occurred last year. This topic/antecedent link also persists in 74b, in spite of the proposed adverbial.¹⁹ We would expect this not to be the case if proposed adverbials competed

¹⁹ In order to make the NP's indefinite, and without any readily available specific reading, the quantifier *several* is introduced. This may contribute a quantifier ambiguity to the sentence; but one speaker said that he preferred the proposed 74b (rather than using the proposed adverbial as a link to the preceding sentence) in order to avoid the possibility that *dozen* had scope over *several*.

with subject properties in defining topics, and could create NP-antecedent links.

The class of topic-like adverbials has been discussed extensively by Kuno for both Japanese and English (1973, 1975).²⁰ In Japanese, adverbials which can be marked with *wa* and which are accessible to relativization contrast with those which have neither of these properties. These THEMATIC ADVERBIALS in English and Japanese are more prominent in discourse than other comparable adverbs—a difference which seems to be caused by a complex interaction of semantic content, real-world knowledge, and immediate discourse context. Since such an adverbial is prominent in the discourse, it does not count as part of a deletable VP; in fact it does not count as differing in content from a VP in the context, and so does not block VP deletion.

While the distinction of thematic and non-thematic adverbials is very subtle, Kuno has found a number of clear contrasts of discourse context and sentence-internal lexical material to illustrate it, and has shown that the distinction is involved in determining the well-formedness of a number of constructions. Preposing of the adverbial is not a necessary condition for giving an adverbial thematic properties in Kuno's sense: an adverbial may be thematic if not preposed, through preposing tends to exclude a non-thematic reading, if a contrast is possible between the readings. We see a pattern here similar to the one discussed above, in which one of two contrasting syntactic forms restricts the range of interpretation, excluding a weaker or unmarked reading. Thus these adverbs seem to be genuine examples of adverbials with the property of being salient in discourse. The exact factors which make one adverbial more salient than another of the same category are not well understood. Interestingly, the salience of the adverbial makes it non-deletable—on the principle proposed by Kuno 1982, that less recoverable information is less deletable than recoverable information. Hence thematic adverbs do not seem to define elements already present in the discourse context, and they differ in this respect from NP topics.

THERE INSERTION, the last case to be discussed in this section, involves the expletive *there*, with an NP which is moved to postverbal position. The postposed NP has the opposite properties of a syntactically salient NP in a syntactically marked position. The postposed NP determines verbal agreement, but otherwise lacks subject properties with respect to grammatical patterns such as Subject-Verb Inversion and Raising. The expletive *there* counts as the syntactic subject for these rules. But even if *there* counts as a salient NP in a

²⁰ It is interesting to compare Kuno's many examples of the uses of *wa* with the range of English constructions discussed here for their relative markedness and topic-indicating properties. Kuno notes (1973:48) that multiple instances of *wa* may occur in a clause, but only one is thematic; the others are contrastive. There are parallels in this case with syntactically defined topics, such as dislocated and topicalized NP's, and with initial elements such as preposed adverbials. Since the subject of sentences like 74 is generally perceived as topic, the natural remaining interpretation for an NP in a more or less sentence-external position is a contrastive one. Similarly, if two NP's are marked with *wa*, and only one may be a topic, then the remaining interpretation for an NP thus singled out from other NP's is the contrastive one. In Chinese, preposed adverbials may have a topic-like interpretation; but it is more normal for the subject to be the anaphoric link between sentences, and for the adverbials to be contrastive (cf. Tsao).

- (64) a. They show their slides of the Grand Canyon at the slightest excuse.
 b. At the slightest excuse, they show their slides of the Grand Canyon.

(65) a. The morning train is likely to be late on any day of the week.
 b. On any day of the week, the morning train is likely to be late.
 In 65b, the preposition of a generic *any*-NP is well-formed, even though the NP type is low on the hierarchy 27-29; this is to be expected if Adverb Preposing is not the kind of rule which defines a syntactically marked position. If, however, Adverb Preposing were a subclass of Topicalization, it would be expected that 65b would be less acceptable than 65a.

It is not easy to distinguish some cases of preposed adverbs from topicalized NPs, and they have been regarded as instances of the same construction (Halliday 1967, Langacker 1974). Further, some cases of preposed adverbials appear to be salient and to have topic properties. But I will argue that Adverb Preposing is distinct from Topicalization in several different ways, and that the cases of a salient preposed adverb or one which serves a connective function in discourse can be explained in terms of additional factors at work. That is, the syntactic properties of an adverb in preposed position in a sentence are not enough in THEMSELVES to make the adverb or its internal NP salient.

Preposed adverbials such as 65b may contain NP types which are not normally topicalized:¹⁵

- (66) a. We think that we can handle anything.
 b. ??Anything, we think we can handle —!

If Adverb Preposing is a subclass of Topicalization, we would expect that the same types of NP which can be preposed can also be topicalized. This appears not to be true, since negative adverbials can be preposed, but as will be illustrated in §7, negative NPs are not topicalized. Further, if the process which fronts negative adverbials with inversion is a subclass of Adverb Preposing, then these cases can be distinguished from Topicalization. The 'site' of the fronted adverb may not be an unbounded distance from its surface position:

- (67) a. Never did they say — [that they would reveal [that the information was given to the person who should have had it.]]

¹⁵ The non-specific interpretation of indefinite NP's seems to be incompatible with Dislocation (cf. Gundel) and with Topicalization:

- (a) We'll find a four-leaf clover within the next week.
 (b) ??A four-leaf clover, we'll find within the next week.
 NP types of the class described in 28, including indefinite NP's with non-specific readings, may occur freely in sentences like (a) and possibly (b). (It is assumed that such sentences are otherwise well-formed and without contrastive stress.) But when NP's of this class are topicalized or dislocated, the results are generally strange:
 (c) *We'll find [itone] within the next week, a four-leaf clover.
 (d) *We chose it, as the best time for the conference, from Friday to Monday.
 (e) ??She discovered it, the rarest specimen.
 (f) ??The slightest noise, he can't stand [—/it] when he's working.
 (g) *They kept them, on him, tidy.
 (h) ??Your goose, they'll be able to cook [—/it] for sure.

- b. *Never did they say that [they would — reveal [that the information was given to the person who should have had it.]]
 c. *Never did they say [that they would reveal [that the information was — given to the person who should have had it.]]

The only well-formed reading is the one which associates the fronted adverb with the immediately adjacent clause. If all the sentences of 67 had been instances of Topicalization, we would expect all the readings to be well-formed.¹⁶

There are further arguments which hinge on the relation of Topicalization to a construction formed in a similar way, namely the Constituent Question. Two constructions which are in the same adjunct position and which involve unbounded dependencies should not be permitted in the same sentence.¹⁷ Halliday uses this argument to show that Adverb Preposing is an instance of a topicalizing process. But in fact there are grammatical instances of fronted adverbials with Constituent Questions which should not be possible if Adverb Preposing is equivalent to Topicalization:

- (68) a. On Thursday, who left —?
 b. On Thursday, who said — we would leave?
 (69) a. That guy, who talked to [him / *θ] for a long time?
 b. That guy, on Thursday, we talked to [him / (?θ)] for a long time.

Exx. 68a-b should be impossible, but they are well-formed. Ex. 69 shows a contrast of well-formedness in the version of the sentence with a gap or with a pronoun. The combination of a Constituent Question and Topicalization is distinctly ungrammatical, while the combination of Adverb Preposing and Topicalization is much better. This is what would follow if Adverb Preposing is a rule allowing options of position in a structure which includes an adjunct in S', provided that nothing else precedes.

I will assume, then, that Adverb Preposing is not Topicalization, and thus does not create a marked or salient NP by itself. One class of counter-instances derives its marked effect by repetition, both of the adverbial and the preposed surface structure:¹⁸

- (70) a. In 1848, Louis-Philippe abdicated from the French throne.
 b. In 1848, Charles Louis Napoleon Bonaparte became president of the Second Republic.
 c. In 1848, revolutionary movements began in many European countries.

¹⁶ Cebuano, a verb-initial language discussed by Bell, allows both adverbials and topicalized NP's in sentence-initial position. Both subjects and topicalized NP's are perceived as marked, salient, and as having the properties of sentence topics; but adverbials are perceived differently. They are not as marked in initial position as term NP's, and are not considered as emphatic (Bell, 171-5).

¹⁷ For questions, relative constructions, and Topicalization, this restriction is a direct consequence of the constraints stated by Ross and by later evolutions of locality constraints, e.g. by Chomsky 1981. But we have no explanation for Left and Right Dislocation are included in the class of thematic constructions, since they involve a resumptive pronoun rather than a gap.

¹⁸ This kind of example was brought to my attention by Hans Uzkoreit.

approximately three groups, in addition to the least marked case:

- (56) a. (Least marked.) Active structures in which no relation-changing rules have applied.
 b. Somewhat marked:
 1. Passive (direct objects).
 2. Raising to Subject.
 c. More marked:
 1. Prepositional passives.
 2. Tough Movement.
 3. Raising to Object.
 4. 'Richard'.
 d. Most marked:
 1. Left Dislocation, Right Dislocation (resumptive pronoun).
 2. Topicalization (gap).

In most of these cases, the marked NP is that which is given subject properties at variance with its semantically relevant grammatical role. The single exception in group 56c is Raising to Object, where the marked NP is a lower-clause subject with the properties of a high-clause object; in 56d, it is an extracentential NP.

Each of the marked NP positions must be interpreted on the basis of very limited information about the constituents of the clause, assuming that sentence processing begins before all the constituents are received and identified. Even if the hearer uses information about the verb, its distinctive morphology, its meaning, and its rule-government properties to anticipate the clause structure, the marked structure nevertheless will have its constituents in an order and form which do not exactly match their underlying roles to the same degree as in the unmarked one. The types of 56d are marked in that an extra constituent must be matched with something within the clause. In each marked structure, the markedness is evident to the speaker of the language because the grammar also specifies a contrasting structure which is in some way simpler, or more directly encodes the grammatical relations. Subjects are particularly implicated in the markedness of NP's, apparently because they have distinctive morphological and syntactic properties in simple clauses. The pragmatic salience of a subject increases in more marked structures.

5. SYNTACTIC CONSTRUCTIONS WHICH DO NOT DEFINE 'MARKED' OR TOPIC NP's. To see how the characterization of syntactic markedness in §4 applies to syntactic structures, let us look at some instances of syntactic constructions which are excluded: those which do not define a marked NP subject position, do not place restrictions on the content of the marked NP, and do not require an explicit antecedent in discourse context. Such conditions involve, e.g., Dative Shift and Adverb Preposing, which do not affect the position or marking of subjects. Similarly, the properties of NP's displaced by *There* Insertion are the reverse of the properties of subjects such as those of passive sentences.

DATIVE SHIFT relates surface structures of the following kind:

- (57) a. Sir Aurel Stein gave a gold watch_i to his Chinese interpreter_j.
 b. Sir Aurel Stein gave his Chinese interpreter_j a gold watch_i.

It is not clear that either of these surface structures is more marked than the other with respect to the case role of the indirect object. The verb *give* is subcategorized for two NP complements, having specific underlying grammatical roles; and these roles are closely linked with the animacy of the NP's instantiating them. It is not immediately obvious which version is basic and which is derived, though the form exemplified in 57a is now generally assumed to be more basic.

If NP's of the types belonging to the scale in 56, above, are placed in either the indirect object or the direct object position, we see no difference in the favored reading or in acceptability. The NP *Smith's murderer* has both attributive and referential uses in 58, regardless of its surface order and marking:

- (58) a. The judge should give the maximum sentence to Smith's murderer.
 b. The judge should give Smith's murderer the maximum sentence.
 (59) a. Give the most difficult problem to a good student.
 b. Give a good student the most difficult problem.
 (60) a. We will send a copy of the report to any correspondent.
 b. We will send any correspondent a copy of the report.

Likewise, the indefinite NP's do not differ in specific and non-specific readings in 57a-b; nor is the acceptability of superlatives affected in 59a-b, or of generic NP's in 60a-b. Pragmatic restrictions of many kinds are associated with dative sentences (cf. Green 1974), but not ones which parallel the variation described in earlier sections.

ADVERB PREPOSING is a somewhat more complex case of a construction outside the markedness scale. It does not change the case-marking of an adverbial for any NP inside it, but it does place the adverbial in initial position, where it precedes the subject in a clause. There are some well-known differences between preposed and postverbal adverbs, dealing with focus and the scope of question and negation (cf. Lakoff 1970, Kuno 1975). In general, preposed adverbs are perceived as being outside the focus of assertion, and also outside the scope of question and negation, so that the two related surface structures are not always equivalent:

- (61) a. We didn't leave because they left.
 b. Because they left, we didn't leave.

But Adverb Preposing does not affect the readings available for NP's within the adverbial, nor the acceptability of NP types far down on the NP scale in §4.

Leaving aside the scope of question and negation, note that it is difficult to find any difference in the readings of the NP's inside the adverbials below:

- (62) a. Life is cheap in Lefty's neighborhood.
 b. In Lefty's neighborhood, life is cheap.
 (63) a. We stopped for about an hour for lunch at a truckstop.
 b. At a truckstop, we stopped for about an hour for lunch.

The attributive reading of *in Lefty's neighborhood* is equally available in both 62a-b, and *a truckstop* has both a specific and a non-specific interpretation in both sentences of 63. There is no difference of acceptability of the NP types in the following:

postposed parenthetical adjuncts. The exceptional members which obligatorily occur in raised structures, such as *find*, have none of the special meaning properties described above, nor can they occur in postposed tags:

(52) a. Leslie tends to drive too fast.

b. The smallest example of each species tends to be hard to identify.

Ex. 52a can be uttered without first-hand knowledge; and a superlative is possible in raised position, in 52b. These facts suggest that the existence of a contrast of raised vs. unraised structures is necessary if there is to be a marked position.

The same contrast is observed in the 'Richard' rule governed by verbs of perception, e.g. *look*, *taste*, and *smell*:¹²

(53) a. It looks like the dog has been digging in the garden.

b. The dog looks like it's been digging in the garden.

(54) a. It smells like the dog has been wallowing in the pond.

b. The dog smells like it has been wallowing in the pond.

In (53-54b), the dog has the perceived properties, while in the 'unRicharded' cases, the situation is the basis for the perception. But the situation in general may include some specific individual, so that it is not inappropriate or misleading to use (53-54a) if the speaker has perceived something specifically about the dog. Only if the speaker LACKS first-hand perception is it inappropriate and misleading to use (53-54b).¹³

Where a syntactic contrast is possible, the use of a marked structure in effect singles out an NP and gives it wide scope over the rest of the sentence (parallel to the REFERENTIAL reading discussed by Fodor & Sag 1982). This wide-scope reading, which is really the semantic counterpart of the pragmatic notion of topic, is combined with the meaning of the verb which licenses the raised

¹² An alternative view taken in Dowty 1978 is to treat 'governed' movement rules as involving pairs of different surface structures, each associated with a different but closely related verb. *Seem*, *seem*, which takes an infinitive complement and would have a wider range of meaning than syntactic markedness here, it does not crucially matter which approach is taken; but the difference has some consequences in defining how representation of the syntax in the grammar picks out what the speaker of a language must have available in order to perceive what is marked in syntax.

¹³ The basic claim made here about verbs of the 'Richard' class is that the two sentence forms related by this 'rule' or construction differ in the amount of direct evidence that is required, apart from the sensory mode referred to by the upper-clause verb (*taste*, *look*, *feel* etc.) With an impersonal upper-clause subject (*it looks* etc.), the speaker may felicitously utter the sentence with or without direct evidence of the referent of the lower-clause subject. Some speakers may differ, however, on how sensory evidence can be used as evidence, depending on the verb used. So it may be difficult to use *ex. (a)*, below, if one has direct perceptions of the sofa, and it may be difficult to use *taste* for any indirectly based perceptions of an NP:

(a) It feels like the living room sofa is being jumped on.

(b) It tastes like the soup was cooked too long.

(c) The soup tastes like it was cooked too long.

Here (b) may not be distinct from (c), because of the specific nature of *taste*. These variations add to the difficulty of specifying the contribution of syntactic structure to the ways that these sentences contrast in interpretation.

structure to yield the 'strong' interpretation. Whatever property makes the verb potentially transparent, even in the unraised case, also associates the strong reading with the neutral one, as does the option of taking an NP interpretation as referential rather than quantifier-like.¹⁴

A similar pattern of marked structures having special conveyed meanings can be seen in prepositional passives, for which an account has been proposed by Davison 1980b:

(55) a. Leonard has jumped on this sofa.

b. This sofa has been jumped on by Leonard.

The prepositional object appears in subject position in 55b, with the marked property of being not only an object but also a prepositional object, assuming that the lexical entry *jump* (and other intransitive verbs) does not contain a special provision for *jump on* and all the other prepositions which may follow it. The special understanding associated with the marked structure is also derived from the literal meaning of the sentence, the marked topic position of the subject, and contextual knowledge: the sofa is assumed to be adversely affected unless Leonard is a famous person, in which case it is an object of interest. It is perfectly possible to use the active form in the same circumstances: a sofa is just as much 'affected' in the real world if someone jumps on it as if it is jumped on.

Thus the unmarked structure is compatible with both the literal and the special meanings. Only the unmarked reading is excluded by the use of a marked form. But the marked reading entails the unmarked one: if the sofa is marked or damaged by someone jumping on it, then someone jumped on it. The properties of the prepositional intransitive passive again follow from the literal meaning of the sentence and its marked surface structure, including the marked NP position with which the marked reading is tied. Its status as topic is more marked than ordinary passive subjects, so that this position should exclude certain NP types. This seems to be true, though it is hard to demonstrate with exactly the same kinds of NP used for detecting markedness in other constructions. Davison 1980b notes that expressions of cause, time, and manner are odd as prepositional passive subjects. Their referents are abstract and indefinite, not easily conceived of as individual entities. Hence they are very much like the NP types which Borkin finds odd in raised sentences. The exception for passives includes certain experiences, like *event* or *month*, which appear to be like the directly perceived time expressions in 16-17. Therefore the markedness of the topic/subject position may serve to exclude NP's pragmatically, without recourse to the scale of accessibility which is stated as a stipulation in Davison 1980b.

In summary, the scale of syntactic markedness divides constructions into

¹⁴ Raising is not a necessary condition on the association of the lower-clause NP with a topic function. Because of the semantic/pragmatic properties of the verbs which govern Raising to Object, the main clause can be interpreted as pragmatically transparent, even though it semantically contributes to the meaning of the sentence. It is pragmatically interpreted as an epistemic modifier of the proposition contained in the lower clause.

NP:

- (41) a. It is difficult to {believe in / get a ride in} a UFO.
 b. ??A UFO is difficult to {believe in / get a ride in}.

The version with Tough Movement conveys something slightly different from the counterpart 36a, emphasizing properties of UFO's in particular rather than of the world.

Certain special syntactic properties set Tough Movement apart from other 'relation changing' transformations (Chomsky 1981, Jacobson 1982); however, the surface structure of 36b is marked, by comparison with 36a, and the NP's in the syntactically marked position of surface subject display many of the same restrictions on NP types as Raising to Object. The marked surface structure is less preferred than the unmarked one in a discourse context having no explicit antecedent for the salient NP:

- (42) a. They look very tired.
 b. It is difficult to paint an entire house in a weekend.
 c. ??An entire house is difficult to paint in a weekend.

Finally, the structure associated with the rule called 'Richard' (Rogers 1971, Horn 1980) differs in the following way from its nearest unmarked counterpart:

- (43) a. It looks like [s John is about to leave.]
 V_i NP_i V₂
 b. John_i looks like [s he_i is about to leave.]
 NP_i V_i NP_i V₂

The subject of the finite complement clause, NP_i, appears as the subject of V_i in the higher clause—rather than of V₂, of which it is semantically the subject. Unlike the infinitive clause in sentences with Raising to Subject, however, the place of the complement subject must be filled, since the complement is finite; a pronoun of the appropriate kind for the coreferent NP appears in this position. This construction allows null elements like *it* and *there*, but not idiom chunks:

- (44) a. It looks like it's going to rain.
 b. There looks like there's going to be a riot.
 (45) a. ??Tabs seem like they're being kept on Susan.
 b. ??John's goose looks like it's finally been cooked after last week-end.
 (46) a. It smells like some headway is being made in the kitchen.
 b. ??Some headway smells like it's being made in the kitchen.

Superlatives and *any*-generics are also odd:

- (47) a. It looks like the smallest sub-atomic particle has been discovered.
 b. ??The smallest sub-atomic particle looks like it's been discovered.
 (48) a. It seems like any doctor knows the answer.
 b. ??Any doctor seems like she/he knows the answer.
 (49) a. It smells like after 5 is the best time to drop in.
 b. ??After 5 smells like it's the best time to drop in.

The raising rules also create contrasts of what appears to be a different sort than those illustrated in the preceding examples, which can be ascribed to

properties of NP's. The contrast shown in 50–51 has to do with the speaker's evidence for what is asserted, rather than the properties of the NP in marked positions:

- (50) a. It seems that Carola is drunk.
 b. Carola seems to be drunk.
 (51) a. We believe that the Earl of Oxford wrote Shakespeare's plays.
 b. We believe the Earl of Oxford to have written Shakespeare's plays.

The raised versions convey that the speaker has first-hand evidence about the truth of the proposition in the complement of the higher verb, as opposed to the unraised version, which is appropriate for expressing both what is known first-hand and what is known from indirect evidence. The difference persists in a variety of contexts, including those where question and negation have scope over the raised structure (Postal 1974). In a context of utterance in which it is unlikely that the speaker actually knew the referent of the raised NP, as in 51b, the raised version suggests greater knowledge of whatever evidence is available.

The contrast between raised and unraised structures has two important properties: it involves a particularly interesting relation between the supposedly different readings, and it can be explained in terms of the markedness of the raised syntactic structure. The raised structure conveys first-hand knowledge of some sort, while the unraised structure conveys both that reading and a more neutral one—the simple proposition, with no evidential modality. Hence the unraised structure exhibits the kind of ambiguity discussed by Zwicky & Sadock 1975 in which the two apparently distinct meanings have an implicational relation. The stronger, 'first-hand', reading implies the weaker one, the simple proposition. The effect of the raised structure is to remove the weaker reading.¹⁰ So the opposition of the two structures is not actually one where a difference of syntax changes meaning; rather, it restricts the range of meanings available in one member of the opposition.

The classes of verbs which govern Raising to Subject and to Object contain verbs whose meaning is closely related to the contrast, in that they deal with perception, belief, and assertion.¹¹ These are verbs which allow a pragmatically 'transparent' reading (Hooper & Thompson 1973), and which also occur in

¹⁰ This is analogous to the lexical example given in Zwicky & Sadock. *Lion* sometimes is taken to mean a member of a certain species, whether male or female. But in contrast to *lioness*, it picks out only a male member of the species. Yet a (male) lion is a member of the species; thus the more restricted meaning is also an instance of the less restricted meaning. The relation of meaning which holds between raised and unraised sentences is much more complex. The complications stem in part from the fact that the embedded proposition and the higher clause have their own properties of meaning, and in part from the fact that contrast of syntactic structures is less evident or easily definable than contrast of single words.

¹¹ *Happen* and *turn out* don't at first easily fit into this category. But sentences with these verbs are used to describe propositions whose truth is not established in advance, or whose truth cannot be assumed automatically from other known facts. *Tend* is an exceptional case, since Raising to Subject is obligatory unless the *tend* clause is further combined with *be the case, be false* etc. No contrast is possible for the surface syntax in which the verb occurs, so there is no contrast of directly vs. indirectly known truth. The full range of meaning is available for the raised structure, even though the features of the syntactic structure pick out a topic NP.

structures. To them may be added NP's with null or negative reference:

- (27) d. Null-referent NP's: *there; it; nobody; no dogs.*

The second group consists of NP's with referents which cannot be clearly identified or individuated. They do not felicitously occur in raised structures in the marked, or salient, position:

- (28) a. Non-specific indefinites: *a man in a black hat* (anyone meeting that description).

- b. Attributive definite descriptions: *Smith's murderer* (whoever it turns out to be).

- c. Generic NP's: *doctors; a dolphin; a typical insect.*

- d. Abstract NP's of place and time: *after 4:00; from Capetown to Hannasville.*

Finally, certain NP types are generally odd:

- (29) a. 'End of scale' superlatives: *the slightest noise; the smallest vibration.*

- b. Any-generic NP's: *any doctor.*

- c. Idiom chunks: *tabs; headway.*

There are two central properties of this three-way division, defined by form and intended interpretation. The first is that the separation of NP types according to the likelihood of their occurring in an acceptable sentence with Raising was established by Borkin on grounds quite independent of syntactic markedness or perception of topic. Yet the divisions are consistent with the notion of topic and discourse antecedent. If the three classes are regarded as points on a scale which ranks lexical items (or complex lexical combinations) by pragmatic and semantic criteria, such as Horn's 1972 ranking of quantifiers and modals, then the scale of NP types (27-29) ranks them as to how clearly or directly the contents of the NP can be used to pick out a particular individual in the discourse context. The NP's differ in how much is represented to the hearer about the entity which the speaker has in mind.

In the rest of this section, I will use the scale 27-29 to survey a range of English syntactic constructions which display degrees of syntactic markedness greater or less than Passive and Raising to Object.

In Raising to SUBJECT, the surface position and subject relation of an NP differs from its underlying position and relation as subject of a verb. NP₁ in 30b appears to be the subject of V₁, with which it agrees, though it is really the subject of V₂:

- (30) a. It seems [that many American Indians died in epidemics.]
 V₁ NP₁ V₂
 b. Many American Indians seem [to have died in epidemics.]
 NP₁ V₁ V₂

If the previous context makes no explicit mention of an antecedent for NP₁, then the unraised 30a is likely to be preferred over 30b. The context 31a has no antecedent, but 31b has one:

- (31) a. Typhoid and cholera may once have been widespread in North America.
 b. The Indian population has almost vanished in some areas.

The combination of 31a followed by 30b gives the impression of disconnection or abrupt transition, though the same context followed by the unraised 30a is not as odd. It expresses a subcase of what is described in 31a, and is not perceived as being specifically about American Indians. Hence we would expect that the structure 30b, which defines the subject NP in marked position as salient and as possible topic, would be best combined with a context like 31b which contains an explicit antecedent.

As with Passive, Raising to Subject permits both kinds of NP's with null or idiom-dependent references:

- (32) a. Close tabs seem to have been kept on all the suspects but one.
 b. Some headway turned out to have been made over the weekend.
 c. There seems to be a mistake in the accounts of the trust.

Superlatives, any-generics, and expressions of space and time are all somewhat odd in the raised version, by comparison with the unraised structure:

- (33) a. It happens that any doctor knows the correct treatment.
 b. ??Any doctor happens to know the correct treatment.
 (34) a. It turns out that the smallest sub-atomic particle has been discovered.

- b. ??The smallest sub-atomic particle turns out to have been discovered.

- (35) a. It seems that after 5 p.m. is the best time to arrive.
 b. ??After 5 p.m. seems to be the best time to arrive.

But the raised versions of (33-35b) may not be as absolutely odd as Raising to Object sentences with the same NP types.

TOUGH MOVEMENT (Postal 1971) produces similar results:

- (36) a. It is tough to crack open macadamia nuts.
 b. Macadamia nuts are tough to crack open.

The structure in 36b resembles that of 30b, except that the NP subject of the higher clause is semantically the object of the complement clause. The restrictions on what kind of NP can occur in the marked syntactic position of the surface subject seem somewhat stricter than for the constructions above, but not as strict as for Raising to Object. Some idiom constituents, e.g. *tabs*, are possible; but others, e.g. *X's goose* and *good care*, are less acceptable:

- (37) a. Tabs are hard to keep on these suspects.
 b. Headway is easy to make if everyone cooperates.
 (38) a. ??John's goose won't be difficult to cook, with this plan.
 b. ??Good care is hard to take of the orphans. (Chomsky 1981:309)

Indefinite generics and superlatives, as well as abstract expressions of time, are peculiar by contrast with the unmarked structure:

- (39) a. It is {hard/easy} to detect the smallest sub-atomic particle.
 b. ??The smallest sub-atomic particle is {hard / easy} to detect.
 (40) a. It was difficult to fix after the 15th as the cut-off point.
 b. ??After the 15th was difficult to fix as the cut-off point.

As with Raising to Object sentences, exx. 39b and 40b are more acceptable if the speaker is assuming some 'direct experience' of the referent of the raised

as raised NP's:

- (18) a. We believe that any doctor knows the answer.
 b. ??We believe any doctor to know the answer.
 (19) a. Scientists believe that a dolphin is capable of extremely high speed even in turbulent water.
 b. ??Scientists believe a dolphin to be capable of extremely high speed even in turbulent water.

The generic interpretation which is possible for 18a is much harder to associate with 18b. No particular individual is singled out in the use of indefinites for generic reference; superlatives are similar in certain ways because they implicate a scale along which individuals can be ranked (Fauconnier 1975). The referent is just whatever is at the end point and meets the description, and to pick out the particular referent means that one must compare all these entities.

- (20) a. They reported that the smallest vibration was measured by the instrument.
 b. ??They reported the smallest vibration to be measured by the instrument.

- (21) a. They declared that the shaggiest dog was the winner.
 b. ??They declared the shaggiest dog to be the winner.

This seems to be true for both abstract and concrete referents; abstract entities are difficult to pick out in the context of discourse; yet even a concrete referent, as in 21b, does not facilitate the 'end of scale' reading, but rather suggests an expressive, non-literal reading of the superlative as an expression of intensity—'really ADJ' rather than 'the most ADJ of all'.

The range of interpretation for NP's such as *a flying saucer*, *Smith's murderer*, and *a dolphin*, and the relative acceptability of other NP types, such as *any-generics*, are determined by the syntactic structure of the sentences in which these NP's occur—and, more particularly, by the syntactic properties associated with the NP subject of the lower clause. The syntactic differences are here indicated schematically:

- (22) a. We believe [that
 NP₁ V₁ COMP NP₂-NOM V₂-PL X
 b. We believe them to be devious.
 NP₁ V₁ NP₂-ACC V₂ X

In the raised structure, NP₂, the subject of the lower clause, has the surface properties of an object: postverbal position with no complementizer intervening, and no indication of agreement on V₂. While the unraised structure in 22a has unambiguous and appropriate (or at least consistent) surface grammatical marking which matches the underlying relations, the raised structure is ambiguous with respect to the semantic roles of NP₂. Models of sentence processing which use surface grammatical information to assign grammatical roles would predict that sequences like 22b could easily be mis-parsed, assigning NP₂ to the higher clause as the object of V₁. Only after the rest of the sentence is processed is information available which places the clause boundary between V₁ and NP₂, and assigns NP₂ the role of subject.

Hence the whole structure 22b is probably quite 'marked', compared with others permitted in the language; and the NP subject of the lower clause is particularly 'marked', since its surface properties are so much at variance with its underlying role, which is 'subject' in whatever thematic role is assigned by the verbal complex which follows (cf. Chomsky 1981). In the account of syntactic processing proposed here, the grammatically non-transparent or marked properties of the NP make it salient, and its salience in turn makes it an NP likely to be perceived as a topic. As such, its referent will be the first one to be searched in the discourse context. The search is clearly facilitated if the NP's contents give some clear indication of the intended referent. Hence the markedness of the position tends to rule out, as less acceptable, non-salient readings of an NP—where the referent is NOT easy to pick out in the discourse context—since no single or existent referent is pragmatically implied.

Another sort of NP which is likely to be rejected in the marked NP position is the kind which has no independent reference. The syntactic markedness of the structure under discussion distinguishes two classes of null NP's: those which are part of idioms, e.g. *keep tabs*, and those which never refer, e.g. *there* and *it*. Fully specified NP's with a negative quantifier also come under this category:

- (23) a. They reported that tabs were kept on all the suspects.
 b. ??They reported tabs to have been kept on all the suspects.
 (24) a. We supposed that John's goose was cooked after the incident.
 b. ??We supposed John's goose to have been cooked after the incident.

Clearly the raised versions of 23–24 are strikingly odd, by comparison either with the unraised counterparts or with the raised versions below:

- (25) a. We imagined there to be several possibilities.
 b. The weather map reported it to be snowing in Florida.
 (26) a. We believed nobody to be responsible for the mishap.
 b. The newspapers report no current employee to be involved in the break-in.

Many parts of idioms and fixed expressions lack independent reference. Likewise, certain NP's such as *tabs* and *headway* have limited or no independent occurrence. They either have no actual referent, or have only some sort of abstract referent such as 'surveillance' or 'progress'. In any case, they make poor topic NP's, since it is hard to imagine how one would talk about some particular tabs or headway.

The scale of NP types is summarized in 27–29, Exx. 27a–c are the NP types with clear referents known to the speaker, and possibly also to the hearer; at least that is what is generally associated with a given interpretation, or represented by the use of a lexical property such as a definite determiner:

- (27) a. Proper names: *Fred*; *Miss Madeira*; *Paducah, Kentucky*.
 b. Referential uses of definite descriptions: *x = Smith's murderer*.
 c. Specific indefinites: *Someone is in for a surprise*; *a certain well-known politician*.

These NP types occur without difficulty in the marked NP position in raised

its subject, since its role is what the verb assigns to its object complement. Hence the passive surface structure does not directly convey the grammatical role relevant for correct semantic interpretation (assuming that the active structure does; see §7). We would expect passive sentences to be more difficult to process, everything else being equal (cf. §1), and so to be more marked than corresponding active structures.

A still more marked syntactic construction yields an interesting test for syntactic markedness and topic properties of particular NP positions. This is Raising to Object (Postal 1974, Borkin 1974):⁸

- (10) a. They believe that (they_i / *themselves_i) are honest.
b. They_i believe {them_i / themselves_i} to be honest.

The NP whose properties vary in 10 is in the lower-clause subject position in 10a, and receives the marking of a clause object in 10b. This is the marked position for this construction. Differences perceived between the raised and unraised position can be attributed to this NP. Thus Borkin shows that English speakers' preferences for one version, or their different judgments of acceptability, depend largely on what kind of NP is in the marked position. She is able to establish a ranking of NP types which are compatible with raised structure, or which are incongruent in that position.⁹

Some NP types in the marked position seem to have varying interpretations. Thus indefinite NPs, used non-generically, can be used to refer either to what ever meets the description, or to some particular thing of which the speaker has some knowledge and can pick out—'a certain one'. Thus use of the raised construction tends to convey only the specific indefinite interpretation, whereas the finite clause structure leaves the interpretation open for either one:

- (11) a. The police believe that a gang member was responsible.
b. The police believe a gang member to be responsible.
Where the specific interpretation is pragmatically unlikely, the raised structure is somewhat odd, especially in a context which suggests that the non-specific interpretation is intended:
(12) a. The carrots and lettuce are doing very badly.
b. ?We suppose a rodent to be attacking the garden.
c. We suppose that a rodent is attacking the garden.

⁸ For this discussion, it is not crucial whether the embedded subject actually becomes a member of the upper clause, as argued in the references cited, or stays in place but exceptionally receives accusative case, as in Chomsky 1981. In either instance, the lower-clause subject appears to retain its topic properties, even though the clause boundary next to it is obscured. Borkin argues that the S boundary is retained.

⁹ Borkin also notes that the ranking of NP types can sometimes be overridden by the 'right' kind of predicate, so that ordinarily less preferred raised NP types are not infelicitous, provided that the predicate is very 'comment'-like. The variability in judgments of ill-formedness and the influence of other pragmatic factors suggest that the topic properties of the NP in marked position are pragmatically derived. The alternative would be to have presuppositions or conventional implications which are associated specifically with the raised structure, but which disappear in some circumstances.

- (13) a. I am afraid to go out at night.
b. ??The newspapers report a UFO to be circling over Chicago.
c. The newspapers report that a UFO is circling over Chicago.

In the context of 13a, ex. 12b is odd in itself, and is less preferred than the finite version 13c. It is pragmatically odd in much the same way as 14b would be if the speaker had no particular rabbit in mind:

- (14) a. The carrots and lettuce are doing very badly.
b. ?We believe that the rabbit is attacking the garden.
c. We believe that a rabbit is attacking the garden.

In both cases, the context lacks an antecedent for the definite NP and for the specific indefinite. In 14b, the syntactic structure, and not the determiner, rules out the vaguer and more general interpretation of the NP.

A similar distinction occurs for pragmatically different interpretations of definite descriptions—the referential and attributive uses of Donnellan 1966. In the referential use, the speaker has some particular entity in mind; and the definite description, however inaccurate it might turn out to be, is used as a way of pointing to it. In the attributive sense, the speaker need have no entity in mind (and there might be none); but the definite description is used to refer to whatever might fit the specification. Again, the use of the raised structure appears to rule out the 'simpler', attributive use, which requires no direct knowledge on the part of the speaker of the entity referred to:

- (15) a. The chief inspector believed that Smith's murderer was insane.
b. The chief inspector believed Smith's murderer to be insane.

In the second case, the preferred interpretation (though this is a subtle distinction) is referential, while the finite structure places no restriction on possible interpretations. Borkin notes in general that the raised structure is most compatible with first-hand descriptions, which are attributed to the speaker, and with non-opaque descriptions—those not clearly part of a belief context distinct from that of the speaker. The unraised structure allows a wider range of interpretations.

The marked position in the raised structure is not easily compatible with certain NP types which refer to abstract entities, such as extent of place or time, or which refer to no particular individual entity, such as any-generic NPs. According to Borkin (66-7) speakers prefer the unraised versions of 16-17 unless the speaker can imagine having direct experience of the referent of the raised NP:

- (16) a. ?South Africans consider from Capetown to Hannasville to be a long way.
b. South Africans consider that from Capetown to Hannasville is a long way.
(17) a. ?Max reports after 4:00 to be the earliest they'll allow him to read his mail.
b. Max reports after 4:00 to be the most dismal part of the day for him in his new surroundings.
Generic NP's and 'end of scale' superlatives are generally odd if they occur

various clause boundaries:

- (6) a. Those guys, Fran told Harry (that) no one has seen them, in weeks.
- b. Those guys, Fran told Harry (that) they have left already.
- (7) a. Cheese!, restaurant owners realize (that) customers have strong feelings about it.
- b. Cheese!, restaurant owners realize (that) it doesn't appeal to certain customers.

(Analogous sentences also exist for the Right Dislocation construction.)

There is evidence, summarized in Grosu 1982, that the co-indexing of the gap in Topicalization constructions is an instance of obligatory binding (of the kind also found in relative clauses and constituent questions—Akmajian & Kitagawa 1976); but the linking in reference between the NP and anaphoric element in Left Dislocation sentences is an instance of ordinary pronoun anaphora. Hence constructions of the first kind, involving a gap created by the operation of a movement rule (or equivalent statement of obligatory co-indexing) are subject to constraints on the occurrence of gaps, while the pronouns in 7a-b are not. These include island constraints and restrictions on subject gaps following *that*:

- (8) *Those guys, Fran told Harry that —i had already left.

Independently of the restriction on the extraction of a subject in an embedded clause, it is also impossible to topicalize the subject of an unembedded clause.⁷ The sentences in 9 are not ill-formed as strings, representing simple clauses, but the topicalized interpretation indicated by the bracketing is not available:

- (9) a. *?Those guys, [(strangely) —i have already left.]
- b. *?Cheese!, [(often) —i doesn't appeal to certain customers.]
- c. Those guys!, strangely, they_i have already left.
- d. Cheese, often it doesn't appeal to certain customers.

The equivalent sentences with pronouns instead of gaps are all well-formed, as in 7a-b and 9c-d.

Because of the general constraints on the occurrence of gaps, as well as the absence of interpretations such as the ones illustrated in 9, there are fewer well-formed instances of Topicalization than of Left Dislocation. The constructions are both of the general form NP S', and so may be regarded as being in

⁷ This restriction is independent of some formulations of the relation between a gap and another element which must properly govern it, under the Empty Category Principle of Chomsky 1981; if *that* is absent, a co-indexed NP adjunct which c-commands a subject gap would constitute a proper governor. But the limitation can be inferred from other ways of stating the restriction on subject gaps (cf. Kayne 1981, 1983). Subject constituents, since they are in left branches from the dominating S node, are prohibited from receiving co-superscripting indices from nodes dominating S which contain the potential antecedent. But it may be undesirable to claim that Kayne's 1983 proposal predicts the ill-formedness in 9, since it also rules out *Who left?* Nevertheless, it is interesting to speculate that main clause subjects are perceived as topics because they can not be marked as topics by Topicalization—a possible case of complementary distribution of configurations which are assigned the same discourse function. Subparts of subject NPs, such as possessive NPs, can receive topic interpretation. These also would be blocked from extraction by the restriction on left branches.

paradigmatic opposition; but they differ in whether they have a gap, and in the entailed binding properties. The construction subject to the most restrictions is Topicalization; thus it is the marked member of the opposition. Hence the construction and the NP adjunct are marked; and the NP has salience as a marked syntactic constituent. The interpretation of the NP as a topic is associated strongly with this construction. It should not be surprising that the NP in Left Dislocation sentences, which are less marked, does not have a single interpretation as topic. As Prince 1982 demonstrates, the discourse interpretations of Left Dislocation sentences overlap only partially with the function of topicalized sentences. Topicalization marks an NP as 'evoked' in focus'. Topicalization is more consistently used for expressing an NP whose referent is already present in the discourse context. As a result, the construction is not felicitously used for the first mention in a discourse of the referent of the NP, unlike examples of Left Dislocation noted by Prince.

Both these constructions are more marked than simple sentences without adjuncts or coreferent-relations inside the clause. I propose that the syntactic properties of ordinary clauses define topics less strongly than more marked constructions. In the ABSENCE of stronger indicators of salient and topic-indicating constituents, the topic is defined by subject position and morphology, including case-marking and verbal agreement. In English, subjecthood has special properties not shared by other sentence constituents. These include nominative case for pronouns; determination of the person and number features exhibited by the verb of a finite clause; preverbal position in non-finite clauses; the privilege of being null in the infinitive, in gerund clauses, and in conjoined finite clauses; and the property of not being syntactically subcategorized by the verb in the same way as postverbal complements.

Subjects therefore have unique properties restricted to one and only one constituent of a clause. Thus they are salient, at least by comparison with other sentence elements, and they may be perceived as topics. The interpretation of subjects as topics may be 'canceled', in the Gricean sense, by stronger topic-indicating factors—e.g. outside contextual information stress, or the referring properties of other expression. Firth 1966 notes many instances of apparent subjects which are not topics in English. The referring properties of NP's which outweigh syntax are discussed in §4, along with the other properties which are incompatible with NP positions in syntactic constructions which strongly mark topics. I will propose two scales, of marked vs. less-marked syntactic constructions, and of referentially 'clear' vs. unclear NP's. Their definitions and interactions are discussed below.

4. THE MARKEDNESS SCALE: ESTABLISHING THE MARKEDNESS OF CONSTRUCTIONS. For an NP to be perceived as a topic, it is sufficient for it to be definite (cf. Haviland & Clark), but this is not required. The contrast of the active and passive in 1a-b shows that properties of syntactic surface structure may also have the effect of marking a topic. In both sentence types, the indefinite NP subjects are perceived as topics; but in the passive version, the surface subject does not have the underlying grammatical role which the verb would assign to

Looking to the context for criteria is not sufficient, either: a discourse context will contain many referential indices, implicit or explicit. Some of these may be shared by the sentence whose topic is to be chosen; but as Reinhart 1981 argues, the prior occurrence of an antecedent (making the second occurrence 'old information') is not enough to guarantee that the NP will be a topic.

I take the position here that the description of topics as being 'what the sentence is about' is accurate; it fits the motives of speakers in choosing the linguistic expressions which mark topics, as well as the use which hearers make of the information which marks topics when they relate the sentence to the discourse context. The choice of a linguistically marked topic implies a discourse antecedent, at least conversationally (Grice 1975). A contribution to a discourse is not very effective or informative if it cannot be linked to something in the discourse. But critical definitions in terms of contextual information are not sufficient.³ Later sections of this paper will be concerned with defining how topics are marked in sentences, at least to the degree that they are marked by syntactic and lexical devices in English.

One of these syntactic devices is the property of being a syntactic subject in surface structure (Li & Thompson 1976). The discussion of the reference of NP's in Strawson 1964 is phrased in terms of sentence subjects, but his subject/predicate distinction has generally been taken by linguists to be one of topic vs. non-topic NP's. What is interesting about his discussion is that it gets at the notion of topic in a way different from those which inquire whether the topic NP has a referent in the immediate discourse context. Thus the consequences for Strawson are not the possible infelicity of a sentence in a given context, or the salience of an NP. His concern is not whether a particular kind of NP is more prominent than others in the sentence, or has an antecedent at all in the world of the discourse; rather, it is whether it has an antecedent at all in the world of the discourse. If it does not, there appear to be different consequences for the evaluation of the sentence as true or false: Strawson finds that the distinction correlates with whether the NP with no referent (in a particular world of discourse) is a surface subject. If it is a non-subject, the sentence is perceived as false. It is false that the chairman of the English Department went to the Champaign Racetrack, if no such racetrack exists. But if the NP is a subject and the sentence has no truth value. If there is no chairman of the Phrenology Department, it is impossible to decide if it is true or false that the chairman went to the stadium. The difficulty with the latter example is explained if asserted propositions are related to the world of discourse by way of the topic NP: and if there is no link of this kind, it is impossible to evaluate the sentence in terms of the world of discourse.

Relating a sentence to a discourse context has been described both in simple terms—finding the link between a new sentence and a set of entities in a context—and in a more complex way, evaluating the truth of a sentence in a particular world of discourse containing various entities. The latter view involves more than mere links: it requires a specific link between what is men-

³ I have found Reinhart's discussion very helpful in defining the issues in this section.

tioned in one sentence and its larger context, the world of the discourse. Exactly how sentences are evaluated for their truth value is affected by what is in subject or topic position; thus Strawson's discussion, through apparently not related to topics, is in fact about them, and provides a considerable amount of insight about their function as a constituent of a sentence. Subjects are necessarily constituents of a sentence, while topics in a broad sense need not be; this considerably complicates the discussion. The definition of topic as a sentence constituent is a useful restriction of the phenomenon for which a definition and explanation is being proposed.

The notion of topic as a sentence constituent is helpful, therefore, in the general question of how a sentence (or rather the proposition which it expresses) is related to a discourse context consisting of entities and relations, or properties predicated of those entities (cf. Joshi & Weinstein).⁴ It is useful, in formal models of discourse (cf. Stalnaker 1978), to be able to isolate a particular entity in the sentence being added to the discourse which may also be found in the discourse context. It is possible to form a number of pragmatic assertions by combining the proposition successively with one of the expressions in it which refers to an entity; but the surface form, which helps to pick out a salient or focal element, rules out some of these possible pragmatic assertions (cf. Reinhart). This is another effect of surface syntactic form which is related to topic. If the topic choice is inappropriate for the surface form, the result is not always an ill-formed expression (as will be seen in §§4-6). So this effect will be shown to be strong in some cases and weak in others.

The principal goal of this paper is to define the syntactic and lexical devices available in English for marking a topic. These devices are features first of sentence constituents, e.g. sentence subjects, and only second of entire discourses. To discover what the effect of these devices may be, it is necessary to remove (or to control as far as possible) the effects of wider context—of subject matter, which calls up related ideas, or facts particular to the speaker's knowledge, purposes, feeling etc. For these reasons, I have investigated sentence rather than discourse topic (following Reinhart's distinction, drawn from van Dijk 1977). In extremely restricted contexts, the sentence topic must also be the discourse topic; and in many extended discourses, it sometimes coincides with discourse topic. But it is not necessary that the topic of a sentence always be the same as that of a discourse.

Several reasons to distinguish sentence and discourse topic are proposed by Reinhart. Non-linguistic objects, such as paintings, photographs, and films—as well as novels, conversations, reports etc.—may be said to have topics; and the topics do not necessarily correspond to any single part of the whole. A sentence is a linguistic object; and so, if a sub-constituent of it is a topic, it is necessarily a linguistic object, amenable to discussion of whatever linguistic

⁴ Propositions uttered as questions also have topics; but sentences with other illocutionary forces, such as request, command, or promise, may not have topics in the same sense as statements. It may turn out that the same topic-defining devices which operate in statement sentences carry over with little pernicious effect to other illocutionary types—certainly to questions, though not necessarily to subjectless requests.

the semantically interpreted meaning. But the various views raise interesting questions about 'where' language is—as part of perception or of reflective processes—and how the two interact with memory.

The question of how grammatical knowledge is implemented, and how it is used in sentence processing, is the subject of much discussion in recent linguistic work. The present paper is intended to supplement current research on sentence processing and the role of syntactic rules in processing. What I propose does not directly address some of the most controversial questions—such as the units of processing, how they are determined, and what automatic decision procedures are applied in indeterminate cases. It does, however, bear on questions which are relevant in models of sentence processing, such as the role of contextual knowledge and how syntactic information is combined with other information. In particular, this paper focuses on differences in surface syntactic structure, particularly in relation to how grammatical relations are encoded.

I have noted some experimental results concerning the role of syntactic structure in the processing of sentences. Differences of surface structure syntax are relevant mainly to the immediate situation of processing, rather than to storage and interpretation, or to recall. These properties will be related in §2 to the notion of sentence topic and its properties. While there is considerable disagreement over the exact definition of topic, there is some convergence on a particular set of properties, involving antecedents of various kinds in the discourse topic.

2. DEFINITION OF TOPIC AND MARKING OF TOPIC NPs. The experimental results surveyed above have shown that the following assumptions can be made: (a) processing of a sentence is facilitated if some element in it can be linked with an antecedent in the context; (b) variations of surface structure such as active vs. passive structures, as well as definiteness, are factors influencing the match of NPs with antecedents; and (c) information about surface structure is available at the time when the sentence is interpreted, but—except in special circumstances—not for very long afterward. These assumptions serve to limit the subject of this paper. If particular features of surface structure are not readily accessible except at the moment of processing, then the connections to context which surface structure helps to indicate must be local rather than global ones, linking NPs in just the sentence being processed to discourse context—but not to the entire discourse, including parts to come. In addition, features of surface syntax must exist which single out a particular NP from all the others encountered. It will be noted here and below that, in general, only one NP per sentence is perceived as a topic; thus some principle(s) must exist by which one NP in a sentence is distinguished from others, which may be equally likely to have discourse antecedents. The NP which is singled out, and related immediately to a discourse antecedent, must be salient in some way, and its salience will have to do with information available at the point of processing. A salient NP may be equated with a topic.

There is an extensive tradition of linguistic work on the notion of topic, which

has variously been identified with old information, given information, and definiteness. As a loose definition, these terms fit the linking of an NP (or other material) to context in some quite general sense. But as Fribas 1964, 1966 and Chafe 1976 point out, these terms do not always define the same thing, in certain combinations of circumstances. Further, while the terms describe linking or identity of an element in the new sentence with a part of the context, they are too vague to predict which NP in a sentence will be the most salient. (Here I will confine the discussion of salience to the aspects defined by grammar and lexicon, rather than the whole array of perception and knowledge; thus my concerns about salience will be considerably more restricted than those discussed in MacWhinney 1977.) Many NPs in a sentence may be definite, or identified with prior context. The antecedent may not occur explicitly in the context, as it may be related to the subsequent NP by a part-whole or other kind of implicational relationship.

The single term 'given' is inadequate to cover the whole range of contextual factors which may be involved. Prince 1980 proposes the term *EVOKE*, which I will adopt, to cover all prior reference to a particular entity in a discourse, whether or not reference is explicit.

Another set of terms refers to the fact that a topic NP linked immediately with context is singled out in some way from the other constituents, at least in subjective terms. This set includes *VIEWPOINT*, *PERSPECTIVE*, *CONTRASTIVENESS*, and *THEME*, or what the sentence is *ABOUT*. In comparing the difference in the ways in which corresponding active and passive sentences are perceived, Jespersen 1924 calls the difference one of viewpoint: the active version expresses a proposition relative to the agent, while the passive presents it relative to the patient. In the Prague tradition, the thematic part of the sentence differs from the rheme in the extent to which the information is perceived as given vs. asserted or new (cf. Fribas). In certain cases, the contrast of givenness and newness may single out a constituent; but the distinction is supposed to be relative, and to operate over the length of a sentence. Other kinds of contrast, indicated by special stress or by parallel sentence structure, allow a single salient constituent to be separated from the others over a part of the discourse larger than a single sentence. But this is more properly the marking of a local discourse topic than of a sentence, and is not found with all the cases where a sentence topic is perceived.

One of the most difficult aspects of discussing 'theme' or 'sentence topic' is that the definition of the term must fit a class of apparently loosely associated, variable, and subjective phenomena. In a discussion of such matters, it is important to distinguish descriptions from criteria. Given that a particular NP is somehow chosen as a topic, it is an accurate and even insightful description to say that it is perceived as referring to what the sentence is about. Even though this description fits other characteristics of topics noted by Kuno 1972—that they are either anaphoric or generic discourse—the description itself does not constitute a criterion for selecting the topic of a randomly chosen sentence in any given context. Even introspection about one's own perceptions does not always yield consistent judgments of what the sentence is about.

condensation, suggesting that accurate surface information is generally not retrievable. An experiment in recognition of sentences (Begg 1971) shows some verbatim recall—at least above chance—for variations of word order, voice, and deletions in surface structure. But memory for surface structure details is not as good as for meaning, and is not affected by cues which influence memory for meaning. Bransford & Franks 1971 find that, in reporting recognition of sentences previously encountered, people ignore differences of conjoined vs. independent sentences, of active vs. passive sentences, and of explicit vs. inferred semantic relations. Thus there is strong evidence that the meaning of linguistic input is encoded in permanent retrievable form, but that information from surface structure is not associated with it in most ordinary situations.

Differences of surface structure, such as that between active and passive sentences, are regarded as being of some consequence in comprehension. But the effects of surface structure in sentence processing are not reflected in tasks involving memory to the same extent as in other situations. The differences are reflected in 'on-line' measures of processing—such as the response time for verification of sentences, matching a sentence with pictures, or producing an utterance on cue.

Many studies have found that passive sentences require longer response times, and are thus more complex to process, than the corresponding active sentences—at least in isolation or in neutral contexts. The complexity of processing can be reduced in the right kind of context—i.e., typically, one which contains an antecedent or previous mention of the referent of the subject of a passive sentence. Processing time is also reduced if a discourse antecedent matches the referent of the subject of the active sentence (Tannenbaum & Williams 1968, Turner & Rommetveit 1968, Olson & Filby 1972, Davison & Lutz 1984). Glucksberg et al. 1973 show an interesting difference in the pattern of response to active vs. passive sentences, involving the verification of a sentence in relation to a picture. Very little effect of context antecedents on processing time appears when the sentence is retrieved from memory, and the PICTURE immediately precedes the response; but differences between active and passive sentences appear when the picture is presented first, and remembered, and the SENTENCE immediately precedes the response. The effect of sentence structure differences appears only in immediate response, rather than in recall.

Sentence production also shows that information about verbatim form in prior context is lost in a fairly short time unless there is some special reason to remember it. Levelt & Kelter 1982 have found that Dutch speakers tend to use an optional variation in the form of oblique NP's if the previous speaker has used that form in a question. The influence of the form of the question on the form of the answer diminishes if some other linguistic material or distracting task intervenes between the question and answer, UNLESS the speaker is conscious of having to remember the question over an interval containing an unrelated sentence. This is an unusual situation, like many others where it is necessary to use extra effort to retain a sentence. In such cases, verbatim form is more strongly reflected in responses.

The crux of the matter seems to be that surface syntactic structure has properties which are perceived when the sentence is related to discourse context. These are measurable while the sentence is being processed, or very shortly afterward. In particular, evidence exists that the surface subject of a sentence makes a difference for processing of the sentence in a particular context, so that there are matches or mismatches of discourse antecedents with the topic/subject. The same effect, in perhaps its most robust form, has also been observed, quite independently of surface syntactic structure, by Haviland & Clark 1974, who find that the response time needed to read and comprehend a sentence is reduced if the context sentence contains an explicit antecedent for the definite NP in the target sentence. As they note, definiteness pragmatically implies that the referent of the NP is known to the speaker and hearer; and if the discourse is so abbreviated as to contain only the context sentence and the target sentence, the antecedent must be in the context—or else it must be inferred, with increase in response time.

If, as seems also to be true, surface structure acts to define a topic, and pragmatically to imply an antecedent, then both surface syntax and the more obvious semantic and pragmatic properties of NP's have topic-defining effects. So it appears that one of the functions of the variations of order and morphology allowed in surface structure is to be useful to the speaker/hearer in the immediate tasks of interpreting sentence structure, and relating the semantically interpreted sentence to the context and the repertory of referential indices available. Once this information has been used for a particular sentence, it is normally no longer needed, and it is not encoded where the meaning of the sentence is encoded and retrievable. Interestingly, some longer-term effects of contextual information result not from syntax but from the presence of a definite article or demonstrative in an antecedent NP. This information helps retrieve an antecedent for a pronoun from a set of possible antecedents (Kantor 1977). However, Joshi & Weinstein 1981 propose that one effect of cleft-sentence form is to withdraw the referent of the non-focus NP from the discourse, so that it is harder to use as an antecedent for later material.

What exactly happens to surface structure information is a question which has been surrounded by much controversy; in one view, there is too much verbatim memory for it to decay and disappear completely, but another view holds that apparent cases of verbatim recall are really reconstructions from other sources of information.² For this study, it is sufficient to claim that surface structure information is involved in processing, and is not encoded along with

² For a defense of these two positions, see Brewer & Hay 1983, Johnson 1983. The former paper reports an experiment in which different parts of memorized texts were tagged with the stylistic features of different styles, so that divergences from the original could be easily identified; this supports the view that accurate recall is largely reconstructed from semantic memory according to external pattern cues. The latter paper proposes a model of memory which encodes perceptual information, including perception of surface structure, separately from material which undergoes conscious reflection and interpretation. This model offers an explanation for the fact that extraordinarily minute details of stimuli may influence recognition tasks, as well as for the degree of verbatim memory which is found.

discussed for the most part independently of these other matters, although there is growing interest in relating topic to processing. But the notion of topic, while amenable to discussion in a very general way, has been elusive when writers on particular languages have tried to define it narrowly for a particular language (Kuno 1973, Tsao 1979 being signal exceptions). In this paper, I propose that topic in English can be discussed in fairly specific and definable terms, provided its discussion is restricted to the contribution of syntactic structure and lexical/pragmatic properties of NPs. Many contextual and variable factors can define a topic; but in the absence of stronger contextual factors which define it in a particular context, certain constituents of a sentence are perceived as more salient or marked than others, and these are topics. This perception is based on the speaker's knowledge of the rules of syntax of the language in question, and the range of lexical information which helps to pick out the referent of an NP.

What makes active and passive sentences different in English and other languages is clear. What is less easy to define is what general properties of surface structure are responsible for defining topics: word order, grammatical role, and unusualness are all possibilities. A fairly wide range of surface constructions in English are compared below to determine the decisive factors in sentence structure.

The basic assumption of the present proposal is that salient NP's and those perceived as topics in a sentence are associated with special properties of surface syntax. In particular, constructions which are relatively hard to process (e.g. passive sentences, relative to the corresponding actives) are also those which strongly define topics. The properties of salience and those which cause difficulty in processing are therefore the same; and an NP is salient because it is in a 'marked' syntactic position, usually one associated with subject grammatical role. A variety of surface syntactic constructions are discussed in §§4-7, below. Note that, for convenience in referring to syntactic constructions, I use the familiar names of cyclic, relation-changing rules such as Passive, Raising etc.; but the discussion does not presuppose that these constructions must be derived transformationally, or that distinct and unrelated transformations are involved.

A principal area of interest in accounting for topics will be in finding the general properties of surface syntactic structure which define such topics, looking at the widest range of cases which can be compared. But since my account is based on assumptions about how sentences are processed, and on the relevance of contextual information in the processing of particular syntactic structures, §1 below is a review of experimental results which justify these assumptions. In §2, major views on the definition and function of topics are discussed. In §3, I consider markedness and the syntactic properties of topics. The main body of my proposal is in §§4-7; here I discuss a range of constructions, as well as the topic-defining strength of particular constructions. These distinctions are based on an independent criterion, which involves combining NPs of various types with a given sentence structure. After discussion of some contrasting cases of syntactic markedness, I return in §8 to how the pattern of

syntactic markedness described here matches the particular ways in which syntax is represented in different theories. In §9, I conclude with a discussion of implications for defining topic and markedness in various languages, and some speculations about how markedness might be integrated into a processing model of English.

1. SENTENCE PROCESSING: SOME ISSUES RELATED TO TOPICS. Given the normal circumstances in which a human language is spoken and understood, the speaker/hearer must process a great deal of linguistic material in a very short amount of time. Processing involves finding an interpretation of sentences, which may be long and complex, and relating interpreted sentences to what has gone before or is assumed in the context of discourse. Further, the hearer encodes the semantically interpreted message in some more permanent form which allows efficient retrieval from memory at a later time.¹

While much is unknown about the exact nature of the human ability to process language, there is experimental evidence about some properties of this ability. The processing of syntactic and other kinds of linguistic information is very rapid, and is not suppressed by distractions. Marslen-Wilson 1973 shows that people are able to repeat sentences word by word as they hear them, with as little lag as the length of a syllable or 250 milliseconds. Errors of syntax introduced into the linguistic input are corrected in repetition; this strongly suggests that some syntactic processing of a sentence takes place 'on-line'—on the basis of information available within short intervals, and possibly before all constituents of a linguistic unit are received and identified.

There has been much speculation about the basic unit in the processing of syntactic and lexical information, and about how much linguistic material is processed at one time in immediate memory before being stored in more permanent propositional form. Jarvella 1971, studying verbal recall of connected text, shows differences in the accuracy with which subjects could recall specific words and the exact text; these differences are connected with the presence or absence of clause boundaries at specific points. Recall is most accurate for linguistic material which occurs in the immediate clause and sentence which is being processed just before the sentence is interrupted for the recall task.

The clause or sentence may be regarded as an upper bound on the size of the unit of processing, but it is not a minimal unit. Marslen-Wilson et al. 1980 measure response times for monitoring a critical word, which might occur before or after a sentence boundary. Their results show that semantic information about the word is available even when it occurs early in a clause; thus some processing apparently goes on before all the parts of a clause have been encountered.

The distinction between linguistic input at the point of processing and linguistic material encoded in long-term memory has been well motivated. Messages encoded in memory are recalled with distortions, interpretation, and

¹ The description of sentence processing in this section is mainly from the viewpoint of the hearer/reader. This is not because of any theoretical bias, but because studies of syntactic structure have largely been about response to sentences rather than their production.

SYNTACTIC MARKEDNESS AND THE DEFINITION OF SENTENCE TOPIC

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Sentence topics are linguistic constituents, with syntactic and semantic properties which single them out for a linking function in the process of relating a sentence to its discourse context. This paper explores the relation between the linguistic properties of sentence topics and their use as discourse links in sentence processing. It proposes a set of criteria for distinguishing relatively weak or strong topic NP's, based on syntactic and semantic/pragmatic properties. Syntactically defined topics include subjects and those in 'marked' NP positions, where the surface features define grammatical function in an ambiguous or indirect way. Implications of this proposal are drawn for several languages, and for various models of language processing.*

It is a common observation that corresponding active and passive sentences differ in what they appear to be 'about'—what they contribute to a discourse—even though they describe the same state of affairs (Ziff 1966); e.g.,

(1) a. A tiger chased a tourist.

b. A tourist was chased by a tiger.

The difference is compatible with a difference of context, so that the sequence of 2a followed by 1a is somehow more 'connected' than 2b followed by 1a, and so on:

(2) a. Wild animals are dangerous even in nature parks.

b. Visitors should not be careless in where they go.

But the context does not determine what will be the syntactically marked topic of sentences like 1a-b; and if the context is vague, the difference between these sentences may persist entirely independently of the context:

(3) An unfortunate incident occurred last week.

So the difference between 1a and 1b must result from internal properties of the sentences—in fact, solely from differences in their syntactic surface structure.

The purpose of this paper is to bring together and to relate some facts about (a) sentence structure, (b) the representation of syntax in grammars of different types, (c) sentence processing, and (d) the notion of sentence topic—which will normally be referred to below simply as 'topic'. Up to now, topic has been

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REVIEW ARTICLE

Women, fire, and dangerous things: What categories reveal about the mind. By
GEORGE LAKOFF. Chicago: University of Chicago Press, 1987. Pp. xvii, 614.
\$29.95.

Reviewed by RONALD W. LANGACKER, *University of California, San Diego*

For three decades, our conception of language has been shaped and constrained by the theory, descriptions, and underlying assumptions of generative grammar. For a century, our notion of meaning has been largely determined by philosophers' concerns for truth, reference, and valid inference; linguistic semantics has often been regarded as nothing more than a special adaptation of formal logic. For two millennia, the Western intellectual tradition has entertained a particular view of thought, reason, and rational inquiry that effectively divorces them from bodily experience. These are all manifestations of a world view which Lakoff calls OBJECTIVISM, and which is taken for granted by vast segments of the scholarly community. Objectivist assumptions are so pervasive as to be almost invisible, and so fundamental as to be virtually immune to challenge. L's goal is to make them visible and to challenge them. The focus of his attack is a linchpin of the objectivist philosophy, namely the classical theory of categorization.

W&EDT is a book that no linguist can afford to neglect: it has implications which extend to all areas of linguistic investigation and far beyond. If L is right, the currently dominant conception of the nature of language, and of how to go about describing it, is fundamentally and irredeemably flawed. Both his critique and the alternative which he develops are grounded in the detailed examination of actual linguistic phenomena: he offers a programmatic yet substantial account of what a COGNITIVE LINGUISTICS might look like, and applies it quite revealingly to diverse arrays of data. A theorist who rejects L's program nevertheless owes it to himself to be very sure that he is aware of the assumptions on which his own position rests, that he understands L's criticisms of them, and that he has some idea of how to deal with the problems considered.

The reader of this review deserves to know that I am not an unbiased observer. I think L is basically right. My own conception of language and linguistic theory (Langacker 1987a), though in large measure independently arrived at, is compatible with L's in all essential respects; we share the vision (rapidly becoming a reality) of a non-objectivist linguistics that reflects the full richness of our mental life and earns the label COGNITIVE not by fiat, but through its naturalness and psychological plausibility. My evaluation of L's arguments may therefore be insufficiently critical (if so, blame the former editor of this journal, who coerced me into reviewing the book). One can rest assured, however, that reviewers with a less compatible outlook will attack them with all due vigor.

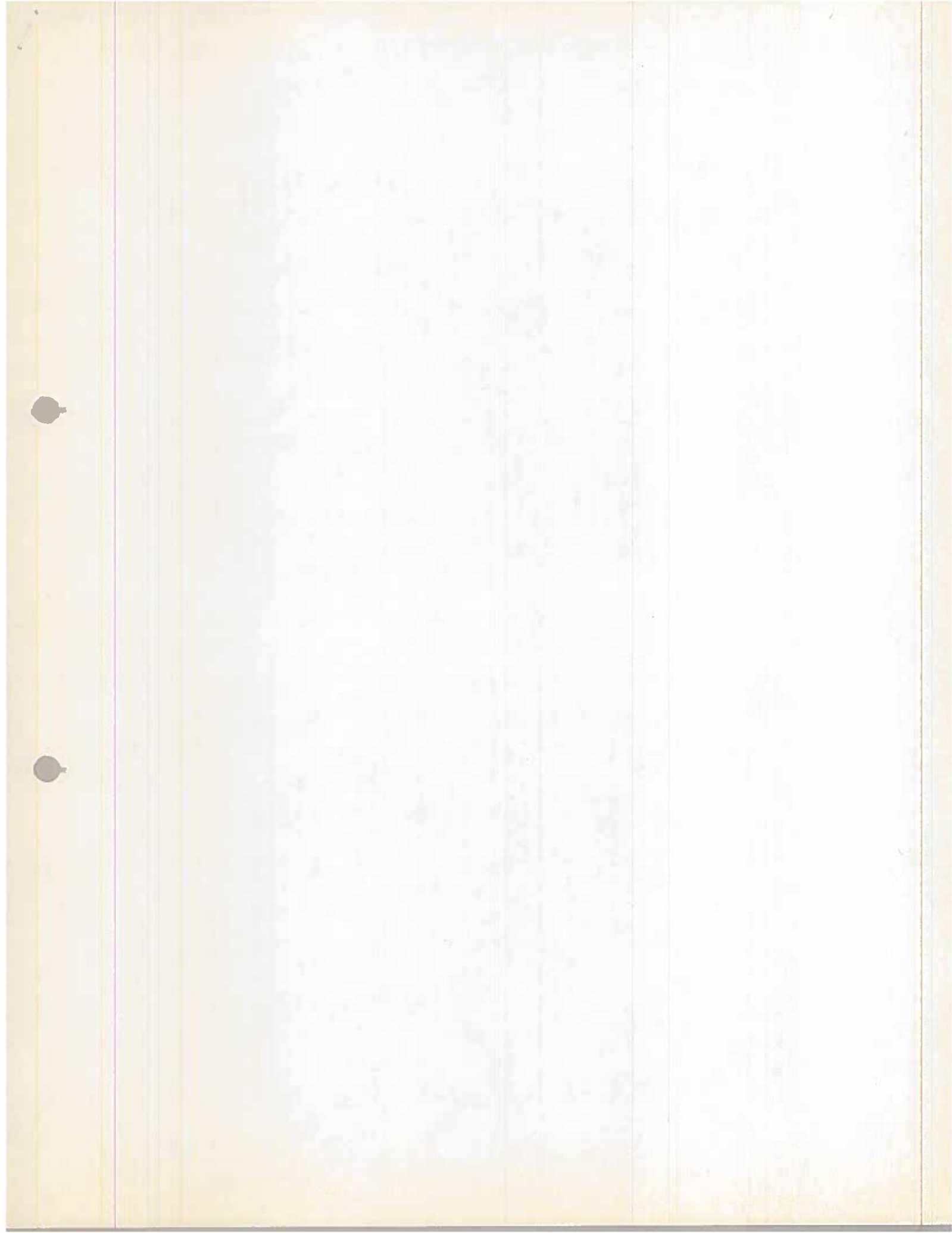
W&EDT is a 'big book' in multiple respects. It is destined to have an extremely wide, multidisciplinary audience (which enables the University of Chicago Press to offer it for a reasonable price). Physically, the book is heavy, and slightly too large to hold comfortably. Furthermore, the extreme length

makes reading it rather tedious even for someone excited by its ideas. The book also has stylistic and editorial shortcomings. One gets the feeling that it was written in haste, and that separate pieces have been stitched together; though it remains a lucid, coherent whole, a better-crafted version can be imagined that would be shorter, more tightly integrated, and less repetitious. The bibliographic format shows glaring inconsistencies, even between adjacent entries, and certain references are badly garbled. The volume overall has considerably more typographical errors than it should, though few if any will impair comprehension.

Besides a variety of supplementary material (acknowledgments, preface, afterword, references, name index, and subject index), *W&EDT* has three main sections. In Part I, 'Categories and cognitive models', L presents his critique of the classical theory of categorization and outlines his own alternative. Part II, 'Philosophical implications', represents a frontal assault on the objectivist paradigm, which L argues to be logically incoherent and empirically untenable. Completing the book are three case studies which total over 200 pages, and which illustrate in detail the kinds of descriptions and results achievable with L's approach. Altogether, L deals cogently with an impressive range of issues spanning numerous disciplines.

1. Part I has 10 chapters. L first discusses the importance of categorization: then, by tracing its historical development ('From Wittgenstein to Rosch'), he introduces the contemporary model based on prototypes and basic-level categories. The classical theory assumes (a) that a category is defined by a list of criterial attributes—necessary and sufficient conditions for membership; (b) that inclusion in a category is an all-or-nothing affair, determined by objective factors; and (c) that a category has no internal structure—all members have equal status. But the work which L surveys indicates, on the contrary, that categorization is based on human experience, that class membership is sometimes a matter of degree, and that there need be no list of attributes exclusively shared by all members. Often a class is characterized with reference to central members (typical instances), while other, more peripheral members are included by virtue of some connection to this prototype. Psychological studies further demonstrate the special cognitive salience of basic-level categories within a taxonomic hierarchy (e.g. CHAIR, as opposed to the superordinate FURNITURE or the subordinate ROCKERS). The basic level is generally the highest at which we can represent all members with a single mental image, and interact with them through a common motor routine.

Ch. 3 argues that prototype effects 'occur at every level of language, from phonology to morphology to syntax to the lexicon'. Their existence is taken as 'prima facie evidence that linguistic categories have the same character as other conceptual categories' (67). The next two chapters introduce what is billed as the main thesis of the book: 'that we organize our knowledge by means of structures called IDEALIZED COGNITIVE MODELS, or ICM's, and that category structures and prototype effects are by-products of that organization' (68). An ICM is roughly equivalent to what I prefer to call a COGNITIVE DOMAIN. Fillmore



1982) a FRAME, and Schank & Abelson 1977 a SCENARIO. It is some type of knowledge base or structured conceptual complex relative to which a notion is characterized; e.g., *bachelor* presupposes the conception of a society in which everyone is expected to marry soon after reaching a certain age. L identifies four kinds of cognitive models, employing different structuring principles. Some, like that for *bachelor*, are supposedly represented in a propositional format (a somewhat problematic notion—see below). Other ICM's employ abstract IMAGE SCHEMAS, such as the PATH or CONTAINER schema. Also counted as ICM's are metaphoric mappings, where one domain is understood in terms of another, as well as what L (rather loosely) calls METONYMIC mappings, where a sub-model is used to understand the category as a whole.

How do cognitive models give rise to prototype effects? Consider the term *bachelor* as applied to the pope. The pope is certainly a non-prototypical member of the category, but not because he fails to meet the criterial attributes of bachelorhood (adult, male, never having married); rather, the *bachelor* ICM is not fully applicable because of the special circumstances of the papacy. Or consider *mother* as applied to an adoptive parent. In its prototypical sense, *mother* combines a number of sub-models in its ICM: birth, nurturance, legal parent, source of genetic material etc. When, by a metonymic mapping, the term is used for a person playing only some of those roles, its value deviates from the prototype. However, if I am correct in thinking that L understands an ICM as involving some sort of idealized conceptual knowledge (this is not the only place where he is vague in defining a term), there may be a problem with his claim that ICM's are the source of prototype effects. What sort of idealized conceptual knowledge is responsible for the prototype effects observable in phonology (e.g. among the allophones of a phoneme) or for the well-attested phenomenon of focal colors? At the very least, some clarification is required. More generally, though L does provide examples of ICM's giving rise to judgments of prototypicality, he does not pursue the matter carefully or systematically enough to establish convincingly that prototype effects are simply a by-product of ICM's.

In the remainder of Part I, L further develops his theory of categorization, and responds effectively to attempts at reconciling the classical model with the empirical evidence amassed by prototype theorists. Two ideas of fundamental importance emerge in these chapters. The first is the concept of MOTIVATION, which stands in opposition to that of strict or absolute predictability. The second is the extent to which linguists and other theorists tacitly rely on particular ICM's (metaphors and folk models) in characterizing both the problems which they address and the range of solutions which they are willing to consider.

The importance of motivation is shown by RADIAL categories, in which each member is connected to the prototype either directly or through a series of intermediaries; members thus form chains radiating outward from the prototype. Every member-to-member link is motivated; i.e., it represents an extension that is natural in view of linguistic, cultural, or cognitive factors. Of course, when distant members are directly compared, there appears to be no basis for their belonging to the same category. Nor is class membership predictable in any absolute fashion: of the many extensions that could in principle be motivated, only a few happen to be established as part of the linguistic system. Because the classical theory lacks the concept of motivation, ignores a category's internal structure, and insists on absolute predictability of membership, it simply fails to reveal what is going on. And since generative grammarians

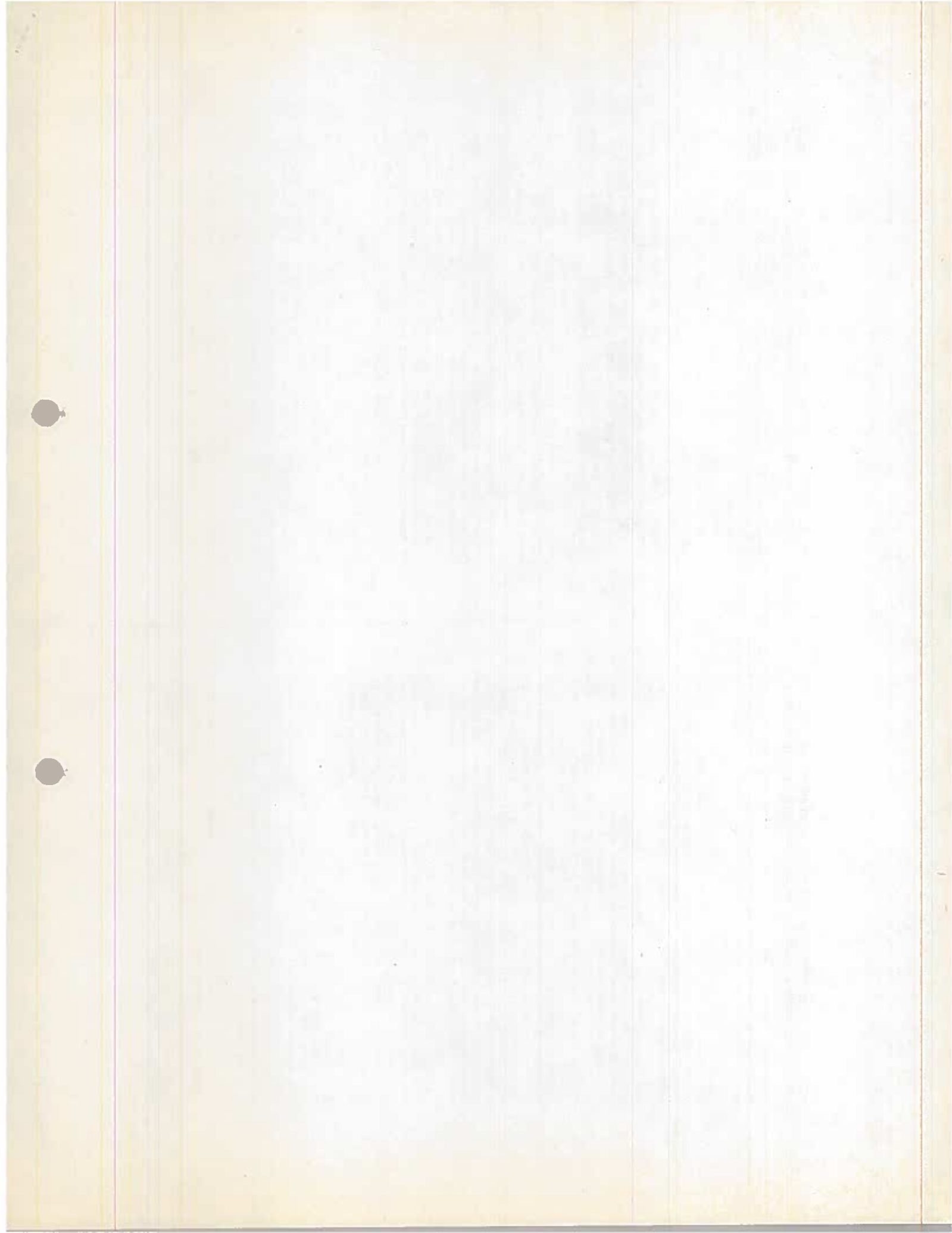
normally assume that theory unquestioningly, they are forced to handle many naturally organized ranges of linguistic phenomena by means of arbitrary lists. In this tradition, extreme concern with issues of predictability, interpreted aprioristically in accordance with the classical model, has made it impossible to describe language in its own terms.

L's initial examples of radial categories are a system of four noun classifiers in Dyak, as described by Dixon 1982, and the Japanese classifier *hon*, as analysed by Downing 1984. Dixon has shown that almost all the seemingly capricious Dyak categorizations (e.g. the *batan* class includes women, fire, dangerous things, crickets, most birds, some trees etc.) follow in a motivated (though not strictly predictable) way from simple core values, given certain principles of extension; thus a noun may be put in the same class as another if it represents the same domain of experience, or if it is attributed a certain characteristic through myth or cultural belief. Japanese *hon* has long, thin objects for its prototype, but it is extended in a perfectly natural, explicable way to myriad other entities, including a hit in baseball. Why a hit? There is actually a double motivation. Metonymically, a hit belongs to the same domain of experience as a bat, which is a prototypical instance of *hon*. Metaphorically, a hit is similar to long, thin objects by virtue of the trajectory the ball follows. It is important to observe that the factors which motivate extensions include principles and relationships with considerable generality; e.g., a trajectory and a long, thin object are image schemas related by a presumably universal IMAGE-SCHEMA TRANSFORMATION, with innumerable manifestations across languages (cf. *The man ran into the woods* vs. *The road ran into the woods*). Furthermore, the model of a radial category based on motivated extensions from a prototype is applicable to all aspects of linguistic structure: theorists cannot dismiss it as a perversion of 'the lexicon'.

One reason that theorists might resist L's proposal is that the classical model of categorization meshes with (and perhaps is the source of) our folk model, so that it seems like simple common sense. Our folk theory of categorization also includes the notion that there is just one correct taxonomy of natural things; L shows how this notion has led to pointless disputes among biological taxonomists. (Linguistics, of course, is replete with examples; consider the problems of genetic classification that arise when the Stammbaum model is applied too strictly.) In general, folk models and metaphors have an enormous influence on how scholars deal with their subject matter, even when they regard their investigation as being fully objective. Another case cited by L is the analysis of perception sentences in Situation Semantics (Barwise & Perry 1983). The analysis incorporates the principle of veridicality (if a sees *P*, then *P*); this accords quite well with our folk model of perception, but is known to be psychologically false. When presented with two lights flashing in quick succession, what subjects see is a single light moving.

It should be added that linguists are strongly influenced by the CONTAINER METAPHOR (Reddy, 1979). According to this pervasive folk model, meanings are packaged in containers (linguistic expressions), and are sent along a conduit from the speaker to the addressee (accordingly, we say things like *He sent her thoughts into words*; *Those are just empty words*; *She finally got her ideas across*, etc.). Because containers have fixed, finite volumes, we are encouraged to regard lexical meanings as analogous to dictionary entries, rather than being encyclopedic in scope (see Haiman 1980); thus we maintain the artificial distinction between semantics and pragmatics. A related metaphor sees lexical meanings as the 'building blocks' for sentence meanings, which are therefore considered fully compositional. A basic tenet of cognitive linguistics is that these metaphors are inappropriate: the meaning of a lexical item is potentially open-ended (invoking ICM's of indefinite expanse), and the meaning of a complex expression is not merely a compositional function of the meanings of its parts—it may invoke an ICM which is not associated with any of its parts taken in isolation. The meaning of the whole is MOTIVATED by its parts to one degree or another, but it is not constructed from those parts.

2. In Part II of *W&DT*, consisting of 11 chapters, L attempts a detailed characterization and refutation of the objectivist paradigm. He begins by spell-



ing out its essential articles of faith:

'All of reality consists of entities, which have fixed properties and relations holding among them at any instant' (160). 'The entities in the world form objectively existing categories based on their shared objective properties' (161). 'Some of which are essential (and give rise to natural kinds), others accidental: all categories are based on such properties and conform to the classical theory of categorization'. 'Logical relations exist objectively among the categories of the world' (162). 'All properties either are atomic or consist of logical combinations of atomic properties' (163). 'Thought is the manipulation of abstract symbols [which] get their meaning via correspondences to entities and categories in the world' [this mind represents external reality and 'mirrors nature']. 'concepts are symbols that ... stand in a relation to other concepts in a conceptual system and ... in correspondence to entities and categories in the real world' (163). 'Human reason is accurate when ... the symbols used in thought correctly correspond to entities and categories in the world and when the mind reproduces the logical relations that exist objectively among the entities and categories ... in the world' (163).

Especially crucial is the INDEPENDENCE ASSUMPTION: 'Existence and fact are independent of belief, knowledge, perception, modes of understanding, and every other aspect of human cognitive capacities. No true fact can depend upon people's believing it, on their knowledge of it, on their conceptualization of it, or on any other aspect of cognition' (164).

L admits that there may be nobody who would subscribe to all these statements without significant qualification: 'The objectivist paradigm, as I ... describe it, is an idealization' (157). However, his goal is 'to bring our intellectual background into the foreground, to show that what have been taken as self-evident truths are really questionable opinions ... All of the objectivist doctrines concerning human thought and language are problematic if not downright wrong. These arguments ... present problems for anyone who holds any of these doctrines' (158). I would further point out that the power of the objectivist world view does not depend on anybody accepting it in its entirety. Rather, it works its influence through the pervasiveness and tacit acceptance of numerous attitudes, working assumptions, and methodological principles for which it can be recognized as the ultimate source. Even if, in its pure form, the objectivist philosophy is universally rejected, it is nonetheless the reference point with respect to which the actual world views of many scholars can be measured—it stands as the archetype that gives these views their coherence, shapes their research agenda in terms of both subject matter and approaches, and determines whether an idea is adopted as a default-case assumption or considered inherently suspect.

The next few chapters represent the core of L's direct attack on objectivism. Ch. 12 argues that classical categorization and the doctrine of natural kinds are incompatible with the modern concept of a biological species:

'Objectivist philosophy likes to view itself as having science on its side. In the case of biological categories, science is not on its side. Classical categories and natural kinds are remnants of pre-Darwinian philosophy ... They do not accord with phenomena that are central to evolution—variation within species, adaptation to the environment, gradual change, gene pools, etc.' (195).

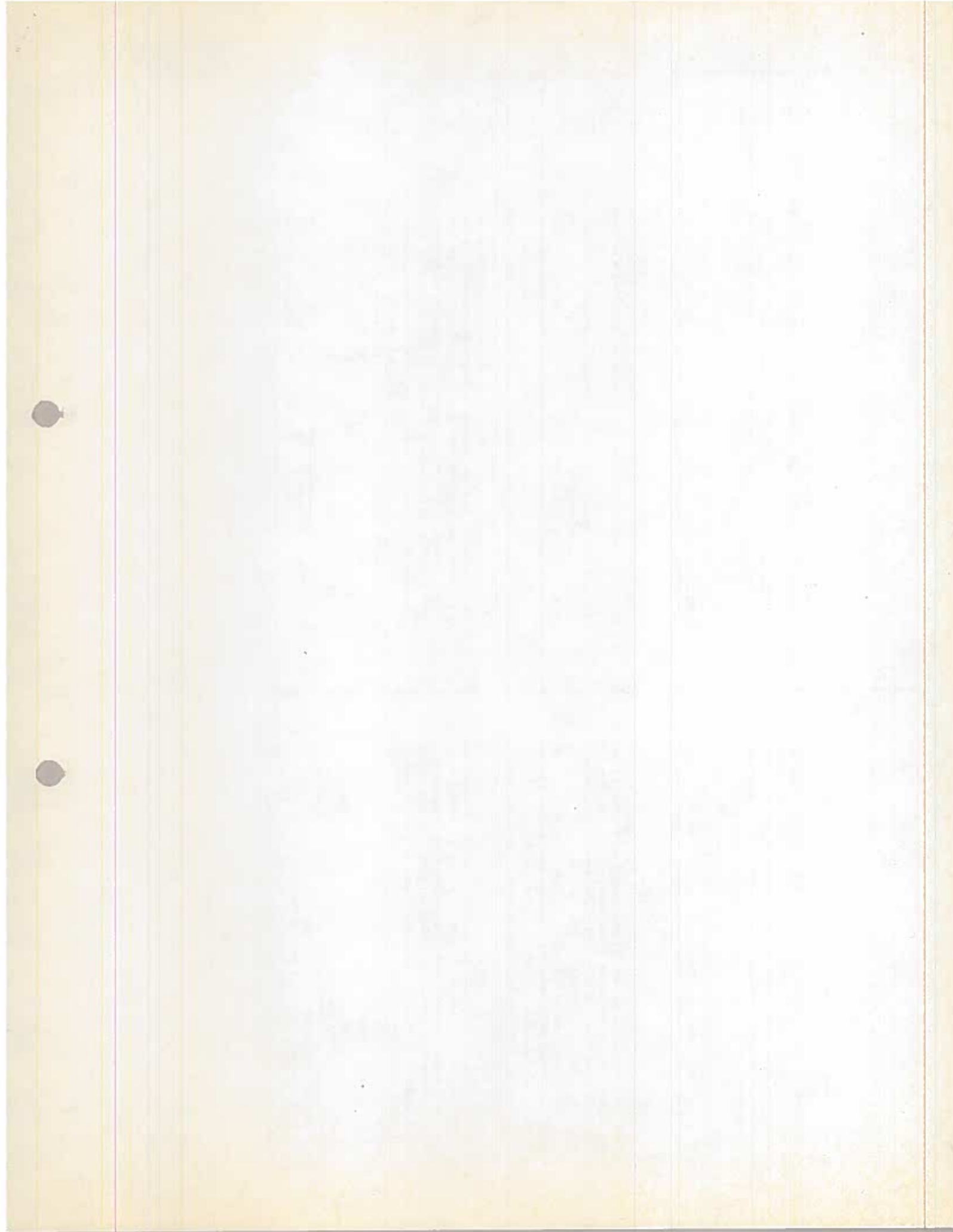
The focus of Ch. 13 is the objectivist view of cognition, which L sees as being contradicted by a host of facts previously discussed: the psychological primacy of basic-level concepts (which are not objectively the simplest), the existence

of alternate cognitive models that structure the same domain in conflicting ways, categories pertaining to 'social and cultural reality' (208), metaphor and metonymy, the radial structuring of categories, and so on. Ch. 14 describes the mathematical notion of a formal system, and claims that 'its use in the cognitive sciences ... has not been adequately justified' (224). There is 'no justification for extending mathematical logic from the domain of mathematical reasoning to the domain of human reason in general' (225). Moreover,

'the idea that natural language syntax is independent of semantics derives from the attempt to impose the structure of mathematical logic on the study of human language and human thought in general' (225). [The definition of grammar] as a kind of system of production rules and a language as a set of strings of symbols generated by that system is not a consequence of mathematical logic. It is not merely a value-free application of mathematics to natural language. It is the imposition of a metaphor—a metaphor based on objectivist philosophy. It characterizes a commitment to try to understand natural language in terms of such systems. The autonomy of syntax ... is a consequence of that metaphor' (227-8).

Introduced in Ch. 15 is what L regards as the ultimate weapon in his assault on objectivism. It is a theorem by Putnam 1981 showing the mutual inconsistency of two fundamental claims concerning model-theoretic semantics: that it characterizes how symbols are related to entities in the world, and that it characterizes meaning. If the meaning of a sentence is a function which assigns it a truth value in every possible situation (or world), then a basic constraint which must be met by any viable theory of meaning cannot be satisfied: that the meanings of the parts cannot be changed without changing the meaning of the whole. Putnam shows, for example, that one CAN change the meanings of *cat* and *mat* in *A cat is on a mat* in such a way that the sentence necessarily remains true in the same set of worlds: the requisite definitions are utterly bizarre from a cognitive standpoint (involving disjunctive conditions and reference that varies depending on circumstances), but an objectivist semantics can hardly appeal to cognitive plausibility in order to rule them out. The problem is that 'truth underdetermines reference in model theory. Preserving the truth of sentences across models does not mean that the reference of the parts will be preserved' (235). Hence 'model theory will not do as a theory of meaning. The models just contain sets. The sets are not understood in any way within a model' (246). 'MEANINGLESS STRUCTURES CANNOT GIVE MEANING TO MEANINGLESS SYMBOLS' (252). L goes on to argue that various attempts at circumventing the consequences of Putnam's theorem are unsuccessful. He concludes that 'no autonomous syntax (of the sort required by generative grammar) could in principle be supplied with an adequate theory of meaning. A theory of grammar that takes syntax as the study of uninterpreted formal symbols will forever be meaningless' (256).

The rest of Part II outlines L's non-objectivist alternative, which he calls EXPERIENTIAL REALISM. L is careful to emphasize that experientialism shares with objectivism a number of basic philosophical commitments: that a real world exists; that we have stable knowledge of it; that there is a valid notion of truth based on more than just internal coherence—and, consequently, that one must reject the view that 'any conceptual system is as good as any other' (158). However, experientialism departs from objectivism by attempting 'to



characterize meaning in terms of THE NATURE AND EXPERIENCE OF THE ORGANISMS DOING THE THINKING. Not just the nature and experience of individuals, but the nature and experience of the species and of communities' (266). A crucial notion is ENHODINENT: meaning reflects 'our collective biological capacities and our physical and social experiences as beings functioning in our environment' (267). Because these capacities and experiences are in fundamental respects very much the same for all people, L's outlook does not commit one to extreme cultural or linguistic relativism.

Ch. 18 discusses the linguistic relativity question at great length. L skillfully disambiguates the many separate issues involved, and shows that the relativity hypothesis can be formulated in dozens if not hundreds of different ways. A central point is the need to distinguish our conceptualizing CAPACITY from the actual conceptual SYSTEM that emerges in a given society; many different systems can be supported by the same capacity, and the conventionalization of a particular system does not render speakers incapable of grasping or learning another. Thus the claim that languages embody different conceptual systems (which L accepts) is not invalidated by the possibility of translation or semantic analysis.

According to L, the emergence of structured, meaningful experience depends on two kinds of PRECONCEPTUAL STRUCTURE: basic-level categories, 'defined by the convergence of our gestalt perception, our capacity for bodily movement, and our ability to form rich mental images'; and IMAGE SCHEMAS, i.e., basic notions such as CONTAINER, PATH, LINK, FORCE, BALANCE, UP-DOWN, FRONT-BACK, PART-WHOLE, and CENTER-PERIPHERY, which 'constantly recur in our everyday bodily experience' (267). Preconceptual structures are 'directly meaningful', since 'they are directly and repeatedly experienced because of the nature of the body and its mode of functioning in our environment'. Other, more abstract conceptual structures are 'indirectly meaningful', arising from preconceptual structures through 'metaphorical projection from the domain of the physical to abstract domains' and by 'the projection from basic-level categories to superordinate and subordinate categories'. Assuming this scenario, the experiential strategy is then to 'characterize understanding in terms of meaningfulness, truth in terms of understanding, entailment in terms of truth, knowledge in terms of truth and understanding, and objectivity in terms of understanding how we understand' (268).

Though L's grand vision is certainly attractive, and strikes me as far more realistic than its objectivist counterpart, its vagueness and programmatic character are obvious. Consider some issues that arise in regard to L's fundamental notion of an image schema (see Johnson 1987 for extensive discussion and justification of this notion, whose validity and importance I accept despite these comments). First, it is not clear what an image is supposed to be. L specifically does not limit the term to visual or sensory images of the sort studied by Kosslyn 1980 and by Shepard & Cooper 1982, which he describes as 'CONTEXT-INDEPENDENT CONCEPTS THAT INVOLVE' (143); thus L apparently contemplates a broad family of images within which sensory images of that genre are only a special case. But how broad and inclusive is this family? Are there any concepts or conceptualizations that are not images? How does one make the distinction? Is it coherent to speak, as L does, of an 'unconscious image' (149)? A further question is whether image schemas are innate. Both from WFCOT and from Johnson 1987, I receive the impression that such schemas are thought of instead as emerging from recurrent aspects of our bodily experience (the

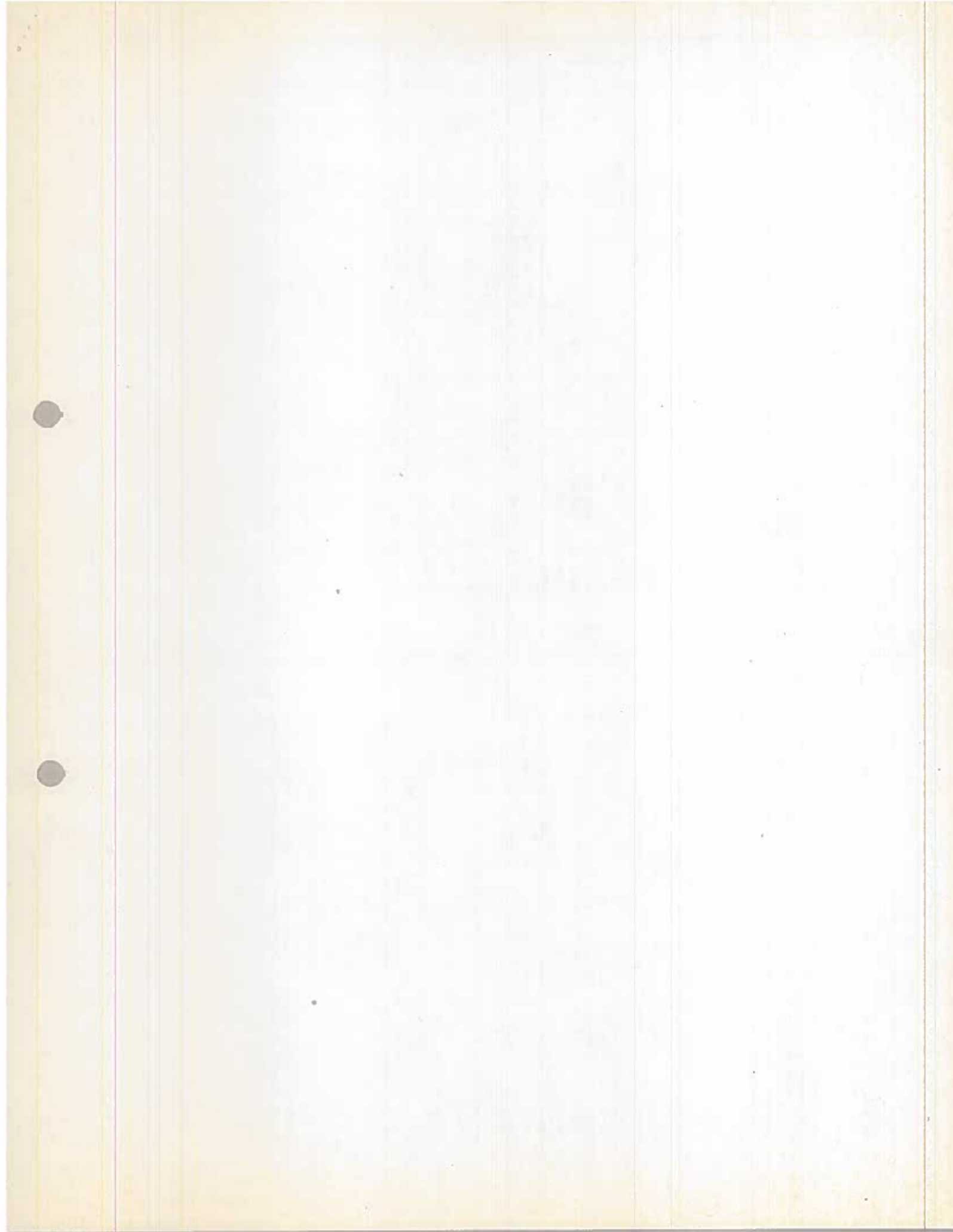
word *innate* does not appear in the index of either book), but precisely how they are supposed to emerge is not specified. I am also puzzled by the definition of a PROPORTIONAL ICM as 'one that does not use IMAGINATIVE DEVICES, i.e., metaphor, metonymy, or mental imagery' (285). How does this square with L's statement, on the very same page, that 'the over-all structure of the proposition is ... characterized by a part-whole [image] schema'? Moreover, if we accept L's claim that only image schemas and basic-level categories are directly understood—with all other conceptual structures deriving from these by metaphorical projections (and by certain other means)—and if we further accept his contention that 'image schemas provide the structures used in [complex cognitive] models' (282), then we can legitimately wonder whether any ICM will be totally free of imaginative devices.

An image schema is a gestalt that is directly understood on the basis of bodily experience and 'used metaphorically to structure other complex concepts' (283). Inherent in the configuration of its structural elements is a 'basic logic', which provides one aspect of our ability to reason. For example, the CONTAINER schema arises because we constantly 'experience our bodies both as containers and as things in containers (e.g., rooms)', and it is extended metaphorically to such domains as the visual field (something comes *into sight*) and personal relationships (*trapped in a marriage*). Its structural elements are an interior, an exterior, and a boundary. These are so arranged that 'everything is either inside a container or out of it—*P* or not *P*'. Moreover, 'if container *A* is in container *B* and *X* is in *A*, then *X* is in *B*—which is the basis for *modus ponens*' (272). Though L's discussion here is sketchy and programmatic at best, he does not hesitate to push these ideas to their ultimate conclusion—that reason, logic, and mathematics reside in the manipulation of image schemas, and are therefore grounded in bodily experience.

'Mathematics ... is the study of the structures that we use to understand and reason about our experience—structures that are inherent in our preconceptual bodily experience and that we make abstract via metaphor' (354–5). 'It does not follow from the existence of logical reasoning that there is a transcendental rationality to the universe'. [but only] that many aspects of real experience can be consistently understood in terms of container metaphors—and metaphors based on other image schemas—in a way that is sufficient for our purposes. Logic, from this point of view, consists of the study of constraints on our modes of understanding' (354).

This idea obviously has great intellectual significance; but L's treatment of it, because of its brevity and preliminary character, falls considerably short of being a well-articulated set of substantive proposals; it will undoubtedly fail to convince the hard-nosed skeptic. Personally, I feel certain that L is very much on the right track, and I look forward to the further development of these notions.

I do, however, have some questions as to the wording and scope of a supporting hypothesis whose basic validity I do not challenge. The 'Spatialization of Form' hypothesis maintains that 'conceptual structure is understood in terms of image schemas plus a metaphorical mapping' (283). This wording strikes me as being imprecise: conceptual structure is the way in which we understand things—not something that has to be understood in terms of something else (except by the analyst). What L means, I think, is that image schemas and metaphor are CONSTRUCTIVE of conceptual structure to a substantial degree. This question of wording is perhaps trivial, but it may indicate a deeper confusion. Among L's illustrations of the Spatialization of Form hypothesis are the following: categories are understood in terms of the CONTAINER schema; radial structure in categories is understood in terms of CENTER-PERIPHERY schemas; metaphorical mappings from one domain to another are understood in terms of the SOURCE-PATH-GOAL schema; hierarchical structure (including grammatical constituency) is characterized by the PART-WHOLE schema; and syntactic 'distance' is characterized by the LINEAR SCALE schema (283, 290). This makes perfect sense to me if interpreted to mean that the analyst (e.g., a linguist or cognitive scientist) uses metaphors based on these schemas in order to describe the psychological phenomena of categorization, metaphor, and syntactic structure. However, this does not appear to be what L has in mind—what he intends, I believe, is that these schemas are CONSTITUTIVE of the phenomena themselves, quite apart from any analysis. That is, our categorizing ability *per se* is inherently dependent on the CONTAINER schema, our capacity for metaphor on the SOURCE-PATH-GOAL schema, and so on. But



is this a plausible or necessary assumption? The radial structure of categories reflects their growth by extension from the prototype, but do we want to say that the schematic notion *CENTER-METAPHOR* figures directly in the process of extension itself? Is it reasonable to maintain that the schematic conception of a part-whole relationship is actively invoked whenever simpler mental structures combine to form a more complex one? Would this apply even to the hierarchical structure of a complex motor routine? To answer positively, I would need more explicit justification than L offers.

3. The final section of *W&DT* comprises three detailed case studies. The first, based on L's joint work with Zoltan Kövecses, examines the metaphorical basis of English expressions for anger. This highly revealing analysis shows convincingly that our notion of anger has an elaborate conceptual structure that is in large measure metaphorically grounded. A number of metaphors can be discerned, e.g. *ANGER IS INSANITY* (*He's fit to be tied*), *ANGER IS AN OPPONENT* (*She wrestled with her anger*), and *ANGER IS A DANGEROUS ANIMAL* (*He unleashed his anger*); however, the most important is *ANGER IS THE HEAT OF A FLUID IN A CONTAINER* (*I had reached the boiling point*). This central metaphor is based on a folk theory (ICM) concerning the physiological effects of anger (increased body heat, increased internal pressure, agitation, interference with accurate perception); and it incorporates the simpler metaphors *ANGER IS HEAT* and *THE BODY IS A CONTAINER FOR THE EMOTIONS*. Our knowledge of heated fluids in containers gives rise to various METAPHORICAL ENTAILMENTS that function as part of our conceptual system. For example, we know that intense heat produces steam—hence the expression *all steamed up* as a description for anger. The use of *explode* and *blow up* for sudden, intense manifestations of anger reflects our further knowledge that steam exerts pressure on a container, which explodes when the pressure reaches a certain level.

The second case study, which examines the many senses of *over*, is essentially a restatement of Brugman 1981. It nicely illustrates a basic claim of cognitive linguistics, namely that a lexical item is typically polysemous—comprising a family of interrelated senses, forming a network centered on a prototypical value. Although the precise array of senses conventionally associated with the expression is not fully predictable, neither is it arbitrary—as the network evolves from the prototype, each extension is motivated in some cognitively natural fashion, and often in accordance with a general pattern or principle. For instance, the relationship between the 'full path' and 'endpoint focus' senses of *over*, as in *Sam walked over the hill* vs. *Sam lies over the hill*, reflects a regular pattern for path prepositions in English (cf. *Sam walked/lies around the corner*, *Sam walked/lies across that field*, etc.). The relationship between the senses of *over* implied by a 'mass' vs. a 'multiple' subject (e.g. *There is mud all over this wall* vs. *There are specks of dirt all over this wall*—cf. Lindner 1982) is based on a recurrent perceptual experience as we move back from a collection of entities, at a certain distance we can no longer distinguish the individual members, but can only perceive them as an undifferentiated mass.

While the analysis is elegant, this chapter has more than its share of inconsistencies, intellectual, and mechanical errors. For example, L is inconsistent regarding whether, in a sentence like *Giants were poised all over the hill*, the set of giants constitutes a single, multiple trajectory, or whether each giant taken individually is a trajectory (428). Similarly, a METAPHORICAL TRAJECTORY (interferently—there is no actual definition) as one in which parts of the trajectory move in relation to other parts, but in the same paragraph we read of a variant in which 'no part of the thing moving moves above or across any other part'. Instead, the entry as a whole traces the reflexive path (433). No justification is offered for the assertion that certain senses of *over* are related by TRANSFORMATIONAL rather than SYNTACTIC links, meaning that the senses do not share a sub-schema (426, 428). Whether a shared sub-schema is in fact lacking depends on one's analysis—e.g., I can

perfectly well imagine a schema that neutralizes the difference between a mass and a multiple subject (*mud* vs. *specks of dirt*). L's presentation is hard to follow in places, in part because he not only uses a complex set of abbreviations for the many senses considered, but introduces alternative abbreviations reflecting different relationships. Correspondingly, schema 2 would be renamed ABV.NC, and schema 2 IDTR in Figure 14 would be renamed ABV.NC IDTR (426). It does not help matters that schemas are sometimes mislabeled (3 p. on p. 429 corresponds to 3 p. E. elsewhere; on p. 433, the same schema is given as both 4 RFF and 4 RPF). Some arrowheads are omitted from Fig. 27 (cf. Fig. 21), and Fig. 24 (which is simply an arrow in the shape of a semicircle) hardly captures what is going on in a sentence like *Rolf let the dog over*. Also, L's discussion of the grammar of adverbs and the passivizability of *spill the beans* should have included references to Chafe 1968 and Gorbett 1973.

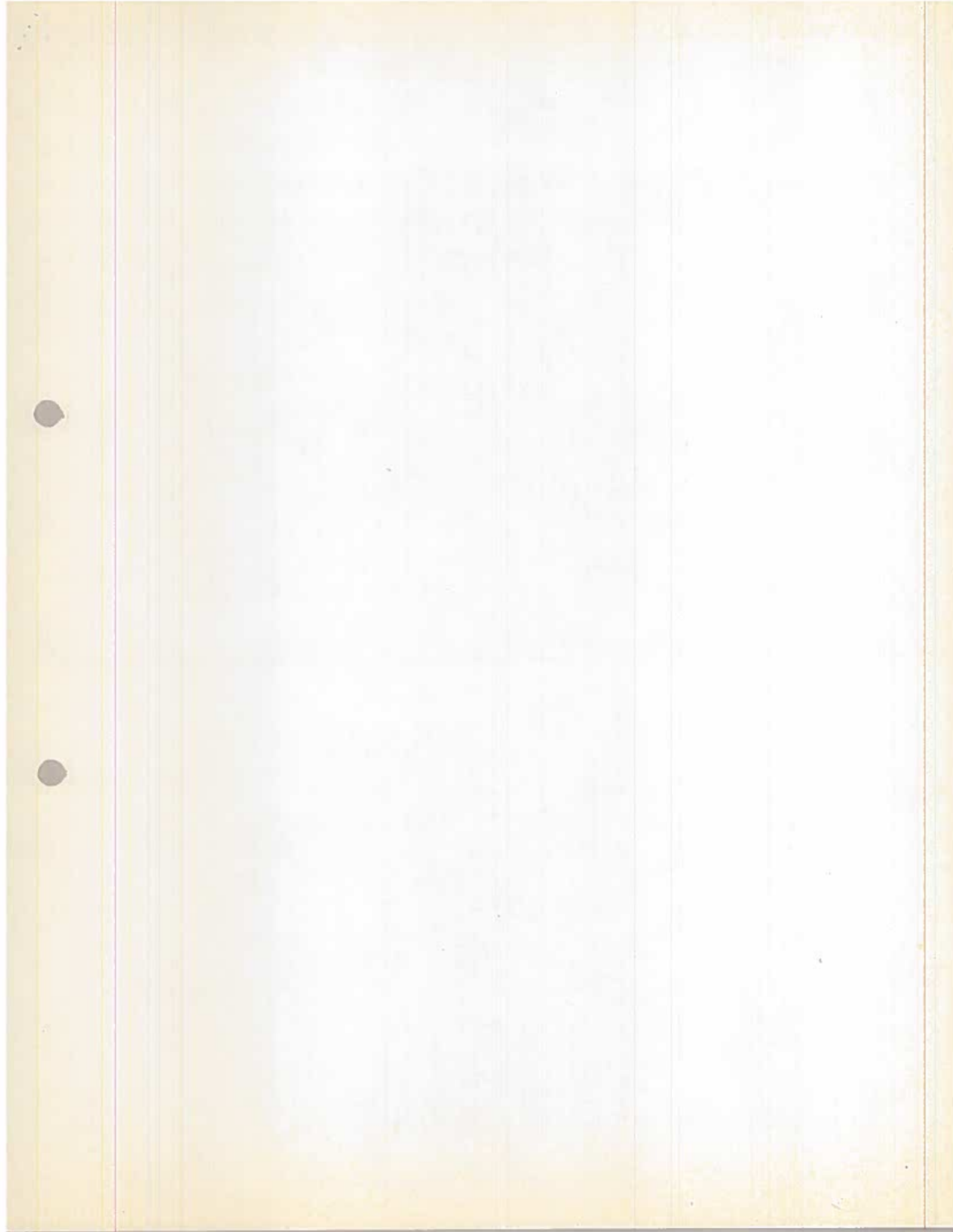
At 124 pages, case study number 3 by itself is longer than many linguistic monographs. It deals with *there*-constructions in English, both dative and existential, and it illustrates the kind of grammatical analysis and description which L envisages in the context of cognitive linguistics. Central to this approach is the notion of a GRAMMATICAL CONSTRUCTOR—i.e., a form meaning pair (F, M), where F is a set of conditions on syntactic and phonological form and M is a set of conditions on meaning and use (467). By contrast,

'in most contemporary formal theories ... constructions ... are considered epiphenomena—consequences of ... rules of a very different character ... Theories of grammar without grammatical constructions simply do not account for anything approaching the full range of grammatical facts ... When prototype theory is taken together with grammatical constructions, it is possible to state regularities that cannot otherwise be stated ... There is no contemporary generative theory that accounts for anything approaching the range of phenomena discussed in this case study' (467–81).

By and large, I believe L's demonstration to be successful. Though hardly flawless or definitive, his description encompasses a wealth of detail, offers a unified treatment of the many, seemingly disparate types of *there*-constructions, and shows that surprisingly many aspects of their form are predictable from their meaning. No future analysis of *there*-constructions can legitimately ignore this one.

In broad outline, the analysis runs as follows. *There*-constructions form a typical linguistic category, whose members can be seen as motivated extensions from the prototype. Each construction derives its meaning from some cognitive model; in the case of the category prototype, the 'Central Dative' (as in *There's Harry with his red hat on*), the 'Pointing-out ICM' serves this function. Given the construction's meaning, many of its formal properties follow as predictable consequences. Thus it is hardly surprising that a construction used for pointing something out should contain a noun phrase corresponding to the entity pointed out, or that *there* or *there* should appear in it, or that it should occur in the simple present tense. A non-central construction, e.g., the 'Perceptual Dative' (as in *There's the beach*) is based on the central construction, and inherits all the parameters of form and meaning compatible with its own ICM. In general, very little has to be specified—given independently established conceptual metaphors, the Perceptual Dative construction is fully described as being based on the Central Dative, and being ABOUT non-visual perception. L argues that the existential *there*-constructions (e.g. *There's a fly in my soup*) form a category parallel to the dative constructions, with the Central Existential construction based on the Central Dative. He proposes that 'existential *there*' designates a mental space (in the sense of Fauconnier 1985) in which a conceptual entity is to be located' (542). L claims the remarkable result that the Central Existential construction, with its distinct grammatical properties, is fully described by just two specifications: that it is based on the Central Dative, and that the element corresponding to location in the Central Dative is identified as a mental space. This should give some idea of the explanatory power of grammatical construction theory. All of the full representation is predictable from the locational location and one semantic condition (555).

I have various quibbles and qualifications. Thus I have argued, in publications with which L is presumably familiar (e.g. 1982, 1987b), that the present tense does not constitute the utterance of a sentence as 'instantaneous' (471), but rather as an interval of time, and that *be* is not a 'predicator of location' (497), but rather a schematic imperfective verb giving temporal extension to an atemporal relationship. I also wonder how many of L's predictions could actually have been made



beforehand, without knowing the details of the constructions involved, on the basis of his informal semantic descriptions. Hostile critics will doubtless find much more to complain about. Nevertheless, open-minded scholars will have to admit the depth and insightfulness of L's analysis. Whatever its limitations, it achieves far more than the standard generative account—which makes no connection at all between the existential and deictic constructions, ignores the subtle differences among the various subtypes of each, regards *There is a fly in my soup* as synonymous with and syntactically derived from *A fly is in my soup*, attributes no semantic value to *there*, and fails entirely to explain grammatical form on the basis of meaning. The two descriptions represent vastly different mental worlds, and L's is far more natural and interesting.

4. From the foregoing survey, it should be obvious that *WF&DT* is an enormously ambitious work. Ambition has its price. No book that embraces so many different areas of inquiry, and which takes radical positions on so many issues of fundamental intellectual import, could possibly manage to satisfy all the inherent demands of the task and fully succeed in all its objectives. In striving to show us the 'big picture', L has effectively foreclosed the possibility of dealing with any one issue in a truly definitive fashion. It is hard to fault his choice, for it is only by seeing the big picture that we can fully appreciate the rationale for approaching specific questions in the way he advocates. But by making that choice—and by arguing his position so forcefully—L has ensured that *WF&DT* will be a center of controversy for many years to come.

L does not exactly keep a low profile; and for those inclined to attack it, *WF&DT* offers many inviting targets. Critics will note its mechanical errors, stylistic deficiencies, and polemic tone. They will observe the vagueness of some central proposals and the programmatic character of L's non-objectivist theories. Linguists will point to the lack of formalization, the absence of a coherent over-all description of how a linguistic system is organized, and L's failure to show precisely how he would handle a broadly representative array of grammatical phenomena. In short, they will argue—with some basis—that he has not presented sufficiently well-articulated alternatives to objectivist accounts, or conclusively established their viability. Still, L's achievement is remarkable. He has cogently dealt with an extraordinary range of topics, issues, and disciplines. He has presented an array of insightful linguistic analyses, some worked out in great detail. He has succeeded in what I take to be his most basic goal: to make visible the objectivist assumptions that are fundamental to our intellectual tradition, and to make it apparent that they stand in need of explicit justification and are subject to legitimate dispute. Beyond that, L has advanced a substantial and coherent body of proposals toward a non-objectivist account of cognition in general and language in particular. *WF&DT* is a milestone in the emergence of cognitive linguistics, and an important stepping-stone for its future development. This is a major work that cannot be ignored.

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